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REVIEW

OF THE

HISTORY OF MEDICINE,

BY

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TO

SIR JAMES Y. SIMPSON, BART., M.D., D.C.L.,

ONE OF HER MAJESTY'S PHYSICIANS FOR SCOTLAND, AND PROFESSOR OF MEDICINE AND MIDWIFERY IN THE UNIVERSITY OF EDINBURGH.

THE DISCOVERER OF THE MARVELLOUS

ANÆSTETIC VIRTUE OF CHLOROFORM,

AND THE IMPROVER OF

MEDICINE, SURGERY, AND MIDWIFERY;

THESE TWO VOLUMES

ON

THE HISTORY OF MEDICINE

ARE DEDICATED,

WITH SENTIMENTS OF ESTEEM AND RESPECT,

BY HIS FRIEND,

THE AUTHOR.

ERRATA.

INTRODUCTION, page viii., line 24, for *Indus* read *Hyphasis.*

" " xv., — 8, for *their* read *its.*

" " xliv., — 25, for *retained* read *maintained.*

" " " — 27, for *habit* read *habits.*

" " xlv., — 1, for *was monoganic* read *were* [*monogamic.*

" " liv., — 26, for *indicate us to* read *indicates* [*to us.*

" lxxxvii. — 18, for *extreme length, fig.* 2*nd*, 5 *in.*, [read *fig.* 2*nd*, 6.7.

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INTRODUCTION.

The importance of medicine can be measured only by the value of life and health, and both being of paramount consequence, it is deserving of the most careful study. The subject is large and difficult, embracing the influence of climate and race, the peculiarities and means of assisting the operations of nature, so as to counteract irregularities in her working, without undue interference in her results; and its aim is to argue from phenomena, and ascertain causes from effects. While engaged in such studies, it must be not only interesting, but useful, to turn back to the history of past ages, to consider those superior minds, which laboured with marked success in the same fields of investigation, under the prompting of the same motives. This investigation will enable the student in medicine the better to appreciate the value of his science, to attach due weight to the discoveries and opinions of able men of different nations, and fairly to estimate their influence in the general advance of medical knowledge throughout the world.

As we trace, in this manner, the progress of science in different ages and countries, and among distant peoples, we detect the means by which new facts are accumulated, and the beautiful structure of nature unfolded; and we observe how much civilisation has gained and lost, owing to personal circumstances and the character of different nations. It is only in modern times that such a knowledge has been obtained of ancient empires and nations, and of their contributions to the intellectual development of mankind, as will enable us to estimate and classify their scientific acquirements.

Neither in science nor in civilisation have the several races and nations started from the same point, or advanced by the same steps; and we must assign their differences not to the accidents of their condition alone, but to the peculiarities of their original mental capacity. While the former have afforded opportunities, the latter have supplied general efficiency, and individual energy or genius, which have suggested subjects, scientific conceptions, and practical devices, perpetuated in families, tribes, and nations. Amongst these, the means of alleviating suffering and curing diseases were early examined; and as there were periods in the history of favoured nations, in which such

knowledge was extensive and correct, so were there succeeding times, when the original systems and works of men of genius were attributed, by their puny descendants, to the influence of supernatural beings. As their practical precepts were first addressed to rude races, without a written language, they were reduced to proverbs and poetic stanzas, as the most useful form, and best adapted to remain engraven upon the memory of a nomadic people.

The grouping and arrangement of such precepts into a regular form, during the progress of civilisation, united with rude investigations into the anatomy and physiology of the human body, and the study of the agents which preserve or modify health, early occupied attention. Such a connected body of truths constitutes the science of medicine. This was gradually modified by the varied experience of individuals in different races and countries, which introduced a critical scepticism into all branches of knowledge; so that the principles of medicine were only established as the result of repeated and correct experiments and observations.

In the following Review of the History of Medicine, the nations will be arranged according to the extent and priority of their intelligence in medicine, as exhibited in the works which have

come down to us. Hitherto facts regarding the ancient history of medicine have been sought for only in the classical authors of Greece and Rome; and have been arranged to suit a traditional theory, which repudiated all systems that did not proceed from a Grecian source. We are familiar from our youth with classical history, and love to recal events, illustrated by the torch of genius, and depicted on our memories; and it requires a thorough examination of a subject, a careful weighing of new evidence, and a degree of ingenuousness not always to be found, to alter early impressions. Still, candour and truth require us to examine the value of new facts in history as they are discovered, so as to arrive at just conclusions. During the last twenty years great progress has been made in our knowledge of the ancient Asiatic empires, and of their systems of philosophy, including medicine, by the partial unfolding of the learning of the Egyptians, by the exhumation of the Assyrian and Babylonian monuments, and still more by the light thrown upon remote Asiatic antiquity, through the sacred books of India, which have brought out a new and most important body of facts, that may necessitate a new arrangement, and the rejection of former beliefs for new convictions.

With such advantages as the means of study and facility of intercourse in Europe afford for the accumulation of learning, it is disappointing to observe the result as shewn in her knowledge of history. When the European student has examined the imperfect records of Greece and Rome, he is held to have acquired a knowledge of ancient history: and yet, long before the former had become famous in arts and arms, and Rome had entered upon her career of conquest, Assyria, Nineveh, Persia, China, and Hindostan were large and populous empires, where the science of government was practised on the largest scale, and where the arts that diversify and embellish life, as well as those that provide for the wants of mankind, were cultivated, and carried to a high degree of perfection.

During the frequent wars of the Asiatic with the Egyptian and Grecian states, and by the frequent intercourse of travellers and merchants, the Europeans acquired a knowledge of the resources of the East, from whence so many of their luxuries and medicines were derived. This explains the invitation which Artaxerxes is said to have sent to the great Hippocrates to visit his court, on the occasion of the ravages of the plague; and the conscientious refusal of the physician,

whose services were required by his own country, then suffering from the same fatal disease. Thirty years afterwards (B.C. 405) Ctesias, of the family of Asclepiades, was taken prisoner, and on healing the wound of the King Artaxerxes Mnemon, was retained as his physician. For seventeen years he held this distinguished position, was on several occasions employed as ambassador to the Greeks, and wrote several historical works. One of them on India, which Professor Wilson has translated, contains notices of some of the natural productions of the country, often extravagant and absurd, yet founded on truth.* The valuable commodities of Asia induced the European merchants to keep up a close connection with it, from an early period; and the riches and power of the great mysterious country of the East attracted the attention of Alexander the Great, when little was supposed to have been directly known in Europe, of the condition of the Hindu nation. The historian of the Macedonian Emperor relates, that after his victory over Porus, Alexander, in his harangue to his troops, assured them "that they were now going to enter those famous countries so abundant in riches, that even what they had found and seen in Persia, would appear as nothing in comparison to

* Dr. Royle's Lectures, p. 71. See also Clinton's Fasti Hellenici, vol. ii, p. 308.

them."* Herodotus, Diodorus, and Arrian describe the strength of the Hindu armies, the number of their war-chariots, the excellence of their arms and appointments, and the strength of their fortresses, shewing them to have made great progress in arts and arms. Strabo and Plutarch agree with them in asserting the high state of civilisation to which India had then attained. It was full of large and rich cities, had roads and mile-stones, and inns for the accommodation of travellers, with numerous institutions for the acquisition and diffusion of learning.† Such a people must have required a long period before it could have reached a civilisation so complete in all its parts, and so permanent in its influence.

From recent investigations, it is found that an empire existed in Gangetic Hindostan, under different dynasties, from the year B.C. 500, to about A.D. 500. During this period, a succession of most enlightened Hindu monarchs reigned in India, who encouraged trade, and facilitated transport by roads which intersected the country, with caravanseries to protect travellers. They promoted, with success, the study of the Sanscrit language, and all useful learning; particularly

* Quintus Curtius lib. x. ch. 1.
† Arrian Exped: Alex. lib. vii. ch. 1. Plutarch's life of Alexander, p. 700.

the diffusion of the medical science. They were often distracted and weakened by intestine dissensions, and became a prey to unscrupulous neighbours, who, at last, subverted their social influence and political power. This ancient and remarkable race pretended to have a direct connexion with the deity. They noted in their records the invasion and occupation of their country by Darius Hystaspes, (about B.C. 530,) and such was its richness, that it was the most valuable of his twenty satrapies.* Two centuries afterwards, the great Persian empire was dissolved by the victories of Alexander; and on his approaching India, Taxiles conciliated the Greek envoy by presents, saying: "I shall send to the great Conqueror, your master, my beautiful daughter; a goblet made of a ruby, that miraculously replenishes itself with liquid; a philosopher of great knowledge of the sciences, and a physician who has such skill that he can restore the dead." † Such a message indicates the possession of great riches, and of Asiatic refinement and learning. Alexander carried his conquests as far as the banks of the Indus, and that he held intercourse with the Indian sages, is evident from the explanation given

* Herod. book iii.

† Yeemut ul Twarikh—Malcolm's History of Persia, vol. i., p. 7. 1 Kings, ch. iv., v. 50.

by the Greek historians of their philosophical opinions. *Porus* (Puru) ruled the country east of the river Hydaspes; and defended it against the invader. When vanquished, he yielded to necessity, and became a faithful follower of the great conqueror; and the subjugated nations exhibited such prowess and magnanimity as elicited marks of admiration. Still, such was the imperfection of their records, that Alexander's name is not mentioned in any of the writings of the Hindus, while he is esteemed a great hero by the Mahomedans. Even those who conquered the distant islands of Java and Sumatra still sing the exploits of the mighty *Iskander!*

Nearchus (*apud* Arrian) states that "the Grecian physicians found no remedy against the bite of snakes; but the Indians cured those who happened to incur that misfortune"—on which account an edict was published, directing that all persons bitten by a serpent, must be brought to the king's tent, where Hindu physicians would cure them; and likewise of whatever disease they might be afflicted with. Many of the views expressed by Strabo resemble those of the Indian shastres, particularly those having reference to generation, the ethereal element, and mental philosophy, are now allowed to have been derived

from the East. He mentions a sect of philosophers in India, named Gamanees, or sacred mendicants, who lived in retirement; and physicians who resided in towns, in a very modest position, and treated the sick. These practitioners relied on a strict regimen, more than on the action of medicines; and on ointments and poultices rather than on internal remedies. A third class were the religious mendicants, who were magicians and sorcerers.* Such a division proves that the ancient Hindus had applied themselves to the art of healing; and from these statements it appears, that the skill of the Hindu physicians was generally and widely appreciated, and that the medical profession had attained a degree of excellence and usefulness to which due credit has not usually been awarded. Seleucus Nicator, one of the most able successors of Alexander the Great, having obtained the province of Babylon, with the eastern boundary in India, penetrated as far as the Ganges, (B.C. 307), and was thus enabled to judge of the progress of civilisation among the Hindus. On being threatened by Antigonus, he entered into an alliance with the Indian sovereign Sandrocottus (Chandragupta), gave him his daughter in marriage, and sent Gre-

* Lettres Edifcantes, tom. xvi, p. 403.

cian auxiliaries to his assistance. Megasthenes resided as his minister at the court of Chandragupta's, and gave much authentic information to the Greeks regarding India. The importance of the information thus obtained, will be rendered still more evident when we consider the race to which the ancient Hindus belonged, and the state of their literature and science at a very early age.

The most ancient traditions and records of the nations of the West refer to "the learning and wisdom of the East," without any distinct indication of the race or nation; and modern investigations prove that the original seat of the Indo-Germanic, or Aryan family of man, was the high table-land contiguous to the lofty range of mountains extending eastward from the Caspian Sea. From this country the great Aryan branch proceeded; and their advancement in civilisation was the more readily accomplished, as both sacred and profane history render it probable that mankind, when they emerged from their primitive home, possessed a high quality of energy and organic activity, accompanied with a corresponding degree of intellectual force. This raised them quickly in power and riches, and enabled them to devote, at an early period, a particular class of the community

to the acquisition of knowledge; and being distinguished by their remarkable powers of accurate observation and sound reasoning, they soon entered the vast and interesting field opened to the exercise of their mental faculties, in the region of abstract speculation. Their progress was aided by their possessing the advantage of a regular and peaceable government, and by being followers of a religion abounding in moral precepts.

This Aryan race were of a fair complexion, and of an enterprising, active, and domineering character. They knew the use of iron, the crafts of the blacksmith, coppersmith, carpenter, and other arts, during the early Vedic age, which, according to Max Müller, extended at least to B.C. 800. They had rims of iron to surround the wheels of their carts and chariots; they fabricated coats of mail, clubs, bows, arrows, javelins, swords, and discs or quoits. They used chariots of war, and conveyances drawn by horses and bullocks, rode on horses, and had the elephant in a state of subjection. They fashioned the precious metals into ornaments — earrings, necklaces, golden bowls, &c. They made cups, pitchers, and long and short ladles for domestic use, and for the worship of their gods. They had professional barbers to cut their hair and trim their nails. They were acquainted with the

virtues of many plants, and prepared a liquor from the Somalatà, or moonplant, the acid Asclepias (Saccostema viminalis), which they considered an acceptable beverage both to god and man, even for purposes of intoxication, as well as exhilaration. In this age, they knew the spirit produced by fermented barley; and vendors of the spirit were tolerated. They made much use of clarified butter (ghrita); had halls of justice, of sacrifice, and of oblation; but no mention is made of idol-shrines, and most probably they worshipped *sub cœlo*. They brought with them to Hindostan the custom of horse-sacrifice (Ashwamedha)—indicating a race accustomed to the northern steppes—thus seeking to propitiate the Deity, by the sacrifice of that which they held most valuable; and their princes, priests, and even their gods, had names and titles derived from their connection with the equine race.*

This remarkable race worshipped the sun, fire, and air, as the symbols of an invisible, omniscient, and omnipresent God; of whom no intelligence could measure the greatness, and no language express the wisdom and goodness. For such a being no temples were required, and no ceremonial necessary. Prayers and sacred hymns were offered

* See lecture on India 3,000 years ago, by Dr. J. Wilson, Bombay.

up with humility in acknowledgment of the greatness and benevolence and justice of God, and of man's own sinful and insignificant nature; and these strengthened the intellect and purified the mind with inward piety and benevolence. From such an intellectual elevation they contemplated that Being, "Who illuminates all, delights all, who alone can irradiate our organs and souls, and to whom all must return." Thus they felt the consciousness of a divine principle, or soul within themselves; which, after death, assumed its proper superiority and immortality, and entered into a state of reward or punishment.*

The Aryan Brahmins, proud of their learning and moral influence among the Turanian mass of the people of Hindostan, were satisfied with their

* "The devout Aryan sage looked upon the natural birth from his parents as the first birth, the partial regeneration during his lifetime as the second, and death as the new birth of the individual. To ensure the purifying and severing of the mortal from the immortal part of the dead body, cremation was employed to set free the spiritual essence, and to complete the third or heavenly birth. The Aryan requiem alone looked forward to this future state, and it is thus expressed in the ancient hymns of the Rig-veda. 'His friends stood around the pyre as around a natal bed, and commanded his eyes to go to the sun, his breath to the wind, his limbs to the earth, the water to the planets from whence they had been derived.' But, 'as for his unborn part, do thou, Lord, quicken it with thy heat, let thy flame and thy brightness kindle it, and convey it to the world of the righteous.' 'Wash the feet of him who is stained with sin, let him go up with cleansed feet; crossing the gloom, gazing with wonder in many directions, let him go up to heaven,' [Rig-veda, x. 16, and Veda, ix. 5.] 'Depart thou, by the ancient paths, to the place whither our fathers have departed, to meet with our parents, our wives, and children; obtain thy desires in heaven. Throwing off those imperfections, clothe thyself in a shining form; may sweet breezes blow upon thee, may thy soul go to its own, and hasten to thy fathers.' See Dr. Muir, Royal A. S. of Great Britain and Ireland for 1865."

riches, their fine climate, and fruitful soil. Insulated in their position, they appear to have been satisfied with the knowledge and power which they had acquired at a very early period; and affectionately attached to their own country, they retained for ages their opinions and practices.

The remarkable Aryan race early separated, and sought their fortunes in different countries. An eastern, or Hindu, and a western, or Grecian, branch early distinguished themselves, and formed great nations, having characteristic peculiarities. Each raised its country to the highest rank among nations in the arts and sciences, and promoted, in a particular manner, the progress of the science of medicine. Both distinguished themselves by their intellectual endowments, which, at an early period, shone forth in the greatest vigour, and produced the richest and most abundant fruits in philosophy and science, in ethics and poetry, in literature, in civilisation, and government, and in all that dignifies and ennobles the species: the western possessed a more careful, practical, æsthetic form of mind; while the eastern, or Hindu nation, displayed more art and perseverance, and their course, if less brilliant, was earlier and more abiding. This was in part from the western knowledge being fostered by commerce, and by the ac-

cumulation of riches introducing the materials of luxury, which, for a time, expanded and polished the intellect, but subsequently corrupted and enervated both mind and body, so that they became the prey of more warlike races. Through the free intercourse of the west, the philosopher of Europe had at all times profited by the discoveries of his neighbours, and the historian was enabled to trace the progress of science among the various nations, from the Indus to the Atlantic ocean, and of medicine, from the time when it emerged from the obscurity of ancient fable in Europe, to the present age; so as to ascertain the national and individual contributions of each to the general fund.

At a period anterior to history, the eastern branch settled in a country called *Aryavarta*, (land of the Aryans), or Hindostan, (country of the Hindus);* and in this fruitful country they rapidly increased in riches and power, and appear to have extended slowly southward. At the time of *Manu*, who compiled his code of laws about the sixth century before Christ, they had not spread further south than the *Vindhyan* range of moun-

* The word Hindu is not Sanscrit. It designates that branch of the Aryan race which passed eastward of the river *Sindha*, the western boundary of India; and as the letters S and H are convertible in the Zend, or ancient Persian language, the name of the river explains the appellation given to those who passed it. The term Hindu was first used by Herodotus and the Greeks, and was adopted by the more modern inhabitants of Hindostan.

tains. By the time of the Christian era, they had conquered Maharashtra, which Ptolemy calls *Ariaké*. From thence they extended themselves to the extreme south of Ceylon, and part of the Indian archipelago.

This Hindu nation left no history, as they considered life a transitory state of trial and suffering, and of too little importance to occupy the attention of rational beings. For many ages the genius of the ancient Hindu nation spread a halo of learning and intellectual vigour around many eastern lands, when the rest of the human family were in a state of rudeness. Sacred as well as traditional history informs us that a civilised people inhabited the east of Asia, and this remarkable nation, which distinguished itself so early by its skill and learning, was the Hindu people. In Europe, those of the east were regarded proverbially as possessed of the "wisdom of the East;"* which may in some measure, explain the first mention made of a social community "as journeying from the East;" † and the productions of their country were in early request among distant nations.‡ From the same quarter, and from his great progenitor Shem, Abraham probably obtained his learning; as we are told that Terah his father "dwelt on the other

* 1 Kings, ch. iv. v. 30. † Genesis, ch. xi. v. 2.
‡ Ibid, ch. xxxvii. v. 25.

side of the flood (the river Euphrates), and they served other gods,"* *i.e.* their worship was mixed up with what were considered idolatrous ceremonies.

"India," writes Mr. Orme, "has been inhabited, from the earliest antiquity, by a people who have no resemblance, either in their figure or manner, with any of the nations contiguous to them;" and Sir William Jones observes, "however degenerate the Hindus may now appear, at some early day they were splendid in arts and arms, happy in government, wise in legislation, and eminent in knowledge." "In medicine," writes the distinguished Professor Wilson, "as in astronomy and metaphysics, the Hindus once kept pace with the most enlightened nations of the world; and that they attained as thorough a proficiency in medicine and surgery as any people whose requirements are recorded, and as, indeed, was practicable, before anatomy was made known to us by the discoveries of modern enquirers." † This more intimate knowledge of the Hindu nation proves, that at a very early age, their sages distinguished themselves by their knowledge, which embraced the most remarkable truths and fundamental principles of natural science. Their understandings thus

* Genesis, ch. xi. v. 2 and 14 † Works, vol iii, p. 269.

invigorated by mental culture, enabled them to appreciate the beautiful structure and uses of the objects of nature. They based their civilisation on their sacred books, supposed to have been received directly from the Deity to assuage the sufferings and misery of mankind; whose mysteries were considered inscrutable, but which the faithful were bound to believe. This unfortunately deadened the activity of the human intellect, and reduced it into a state of apathy and torpor, so as to make the future ages a mere reproduction of the past.

At the early and enlightened period, Hindostan was divided into different principalities, often separated from each other by forests, rivers, and mountains; and governed by princes jealous of, and at frequent war with each other, but over whom the Aryan Brahmins gained an ascendancy, as the dispensers of religion; laws were administered, as promulgated by Manu, and other ancient sages, and the arts and sciences were cultivated with success. At that time the priests were learned, the princes prudent, liberal, and skilful in political transactions, and their Turanian subjects were industrious and frugal.* They im-

* The remains of the magnificent Temples in the south and west of Hindostan belonged to the developed Turanian, rather than to the Ayran race, who supposed no temples were worthy of the great Deity, and only

proved the arts by their natural genius, and the delicacy of their touch; and the hereditary castes handed down to their children the improvements made in their trades, for which they became celebrated. But they had no personal attachment to their sovereign, no patriotism or rights to defend, and without interest in their country's welfare, became an easy prey to their warlike neighbours. When the rajah or chief had once been defeated in battle, the enemy met with no opposition, and the country was subdued.

The Aryan races possessed an alphabet and grammar, were fond of logic and philosophical speculations, and were remarkable for their practical good sense. Their poetry was more didactic than lyrical, and they were the first who composed epics and drama. They were satisfied in architecture with what was convenient, modified by fashion and the usages of the neighbouring nations. They encouraged the useful arts, and devoted themselves to commerce, agriculture and manufactures;

accepted the prayers and humiliation of man, unadorned with gold, silver, or the lustre of precious stones. An interesting example of the knowledge of, most probably, those eastern missionaries, is seen in the mysterious Pillar Towers of Ireland, some of them, most probably, built about the beginning of our era. One of them is in the author's neighbourhood. The stones forming the entrance had been selected with such sagacity, and prepared with such admirable skill, that their edges are as sharp as the day on which the masons placed them, and will remain so for centuries to come; while the Parliament House, built a few years ago with stones selected by able Commissioners, from opened quarries, prepared with the best tools, laid in the best mortar, are already crumbling into dust. Thus, the advanced science of the present day, in this respect, is far behind that of the ancients.

accumulated wealth, and increased material property. The beauty they admired was scientific truth; and the harmony, that of the laws of nature. They carefully studied mathematical science, and its practical results, especially astronomy; and medicine, for its interest and usefulness.

The many ages that intervened before oral tradition was recorded in written characters, and the advancement which such a step indicates, account for the pride which marked these first efforts of genius. The Sanscrit language approaches nearest the primitive type by its originality, its purity, and the abundance of its forms (M. Müller). It was introduced into Hindostan by the Brahminical race, and modern philology enables us to restore the pedigree of the human family, by detecting and explaining the organic and permanent structure of the several languages, according to their respective kindred, proving a useful guide to the historian. The Sanscrit language is found to be the link connecting the Zend (the ancient Persian language), the Armenian, Greek, and Latin, and is of the same family of language with the German, the Sclavonian, and the Celtic. "The Sanscrit language," writes Sir William Jones, "whatever be its antiquity, is of wonderful structure; more perfect than the

Greek, more copious than the Latin, and more exquisitely refined than either, yet bearing to both of them the strongest affinity, in roots and verbs, and in the forms of grammar. This resemblance is so strong, that no philosopher could examine all the three without believing them to be sprung from one common source, which perhaps no longer exists."* Frederick Von Schlegel, some twenty years later, in his "Languages and Philosophy of the Indians," had no doubt that the Sanscrit was not only related to Greek, Latin, and German; but was the very ancestor from which their descent was to be traced: or, as Max Müller puts it, "the first derivative from the primitive Aryan speech." The grammatical works of *Panini*, and his Hindu successors, are the most complete that ever were employed in arranging the elements of human speech. † This majestic and richly inflected Sanscrit is still viewed by the Hindus as their national language, written in the deva nagri character, or divine alphabet, from its supposed origin from the gods; and in this the oldest works in Indian literature are composed. It contains memorials of an ancient theology, embracing poetry, science, and philosophy, which has exerted an influence over the most distinguished

* Asiatic Researches, vol i., p. 422
† Elphinstone's History of India, vol. i., p. 276.

nations of antiquity, and to which Europe is indebted for the rudiments of her learning. This will account for the reference made in these ancient records of the west "to the wise men of the East;" expressions which prove that these Asiatics had established a high character for knowledge and wisdom; their claim to which is rendered evident by their remains.

It was near the river Ganges that these eastern sages dwelt, and there are laid the scenes of many of their most ancient poems. Trained by experience to contemplate the magnificent products of nature, rather than possessing a minute and extended knowledge of the arts and sciences, they were contented with the phenomena which surrounded them; while the self-relying vigour of their mental faculties sufficiently accounts for the varied character of their literary productions for the extent, beauty, and peculiar character of their epic poems, their copious domestic literature, and their unexampled treasure of morals, fables, and romances. The natural want of enterprise in the race prevented their visiting other lands, considering it sinful to look beyond their own rich country, favoured by the special protection of their deities, they came to despise the productions and learning of strangers; while the distance and

the difficulties that existed in acquiring information, account for the eastern learning being unknown in Europe, and their philosophers holding no rank or position in history among the western nations. This circumstance has induced me to attempt, by a few observations, to illustrate the comparative condition of the sciences in the east and west, respectively, in remote ages.

Sir William Jones declares that the Hindu geometry, arithmetic, and astronomy, "surpassed that of Ptolemy; their music, that of Archimedes; their theology, that of Plato; and their logic, that of Aristotle." "S'il est une contrée sur la terre qui puisse reclamer á juste titre l' honneur d'ávoir éte le berceau de l'espèce humaine, ou au moins le théatre d' une civilisation primitive, dont les developpemens successifs auraient porté dans tout l'ancien monde, et peut-être au delà, le bienfait des lumières, cette seconde vie de l' humanité—cette contrée assurement c'est l' Inde."* "It might be easier to compare them (the Hindus) with the Greeks," states the Honourable Mountstuart Elphinstone, "as painted by Homer, who was nearly contemporary with the compilation of the code of Manu; and however inferior in spirit and energy, as well as in elegance, to that

* Creuzer Religions de l' Antiquite, Tom. i, p. 133.

heroic race; yet, on contrasting their law and forms of administration, the state of the arts of life, and the general spirit of order and obedience to the laws, the eastern nation seems clearly to have been in the more advanced stage of society. Their internal institutions were less rude; their conduct to their enemies more humane; their general learning was much more considerable; and in the knowledge of the being and nature of God, the Hindus were already in possession of a light which was but faintly perceived, even by the loftiest intellects, in the best days of Athens.* The Brahmins, as the dispensers of religion, of the laws, and of medicine, have exhibited a superiority of intelligence, which, with the exception of the Greeks, is in vain looked for in other ancient nations. Under the native government, the Hindu literature was carefully cherished by the princes and opulent individuals, who thus increased their temporal power and religious influence. Such encouragement operated powerfully as an incentive to study and literary exertion. It was the endeavour of the influential class, and one of their proudest objects, to cherish these learned Brahmins, many of whom devoted their whole lives to intellectual cultivation; more particularly to

* History of India, vol. i, p. 94.

education and poetry, to medicine and religion; the former preparing the intellect of the rising generation, and immortalising in verse the grandeur of their patrons; the latter explaining the treatment of the body in health and disease, and the means of ensuring happiness to the individual after death.

The study of the heavens was considered by the Hindu sages to be the noblest, whether viewing the order, the economy, and regularity of their movements, or contemplating the sun "as a giant running his course," and travelling unseen through the realms of night, till he returns at the end of the year, to the point from which he set out. The distribution of the stars into groups or constellations in the compass of the visible heavens, extending in each side of the ecliptic, appears to have been made in the earliest ages of the world. It is highly probable that the zodiacs of all nations were derived from a common source; and Sir William Jones supposed the Indian division of the zodiac was not borrowed from the Greeks or Arabs, having been known in India from time immemorial.* A remarkable example of the attention the Hindu Brahmins paid to accurate observation in science is seen in their recording

* Asiatic Researches, vol. ii. p. 289.

astronomical facts from which they drew conclusions, without forming theories. They do not even give a description of celestial phenomena, being satisfied with the calculations of the changes in the heavens. The diurnal revolution of the earth on its axis, the names of the days of the week, and the division of the ecliptic into twenty-seven mansions or constellations, (B.C. 1442,*) are likewise derived from the same source, as well as their more accurate notions regarding the procession of the equinoxes. An intimate knowledge of astronomy is proved from the remarkable Vedic calendar (Jyotisham) of the Hindus, which gives the position of the solstitial points; carrying us back to the year B.C. 1181, according to the able Archdeacon Pratt; and to 1168 according to the Rev. R. Main's calculations. † It is however possible that the Hindus may have improved their more imperfect astronomy from the Greeks of Alexandria, as suggested by the able and accurate Colebrooke. ‡

The remarks of the ancient Hindus in the Aitareya Brahmanan Sattras prove that many correct astronomical observations were recorded

* Bentley's History of Astronomy.

† Jour: Asiatic Society of Bengal, p. 49-50 for 1862; see also Max. Müller, pref. Reg. Vide p. lxxxv, v. 4.

‡ Asiatic Researches, vol. ix.

so early as the twelfth century B.C.; which led Professor Hang to assign the composition of the bulk of the Brahmanas to the year 1400-1200 B.C.*

The second period of the Aryan races in the east reaches a more exalted point of civilisation; the power of abstract thinking and metaphysical speculation was rapidly developed. Man became more refined, especially in imagination, and a sense of the music of language, as employed in heroic poetry. As he noticed the antagonisms of nature he betrayed a deep consciousness of discord in himself, a keener moral sense, and a more anxious desire of deliverance from the impurities of the flesh. Men aimed at a piety they did not allow to the gods, and which their frail nature was not capable of attaining.

The Hindus excelled in arithmetic, and from time immemorial employed decimal notation, the simplest and most perfect of all inventions, by which they performed the various operations in arithmetic, with the greatest facility and correctness. The Arabians introduced this mode of notation into Europe, where the Grecian and Roman method had been followed of employing the more tedious and imperfect method of reckoning by letters of the alphabet. In the ancient

* Artareya Brahmanan of the Rig-Veda, vol. i. Int. p. 47.

until relieved by the assistance of compassionate deities, who revealed the means of relief to favoured individuals. These deities were Siva and Dhanwantaree among the Hindus, and Apollo and Esculapius among the Greeks; and such was the respect the Hindus had for the profession, that one of the fourteen precious objects (ratnas), which their gods are believed to have produced by churning the ocean, was a learned physician. This accords with the notions which the ancient Hindus had of medicine. Having a certain acquaintance with anatomy, they classified diseases according to a systematic order, and treated them upon an uniform plan, agreeably to their philosophical theory. This agrees with their known advancement in civilisation and pretensions to originality; and our earliest records of the west, refer to the extent of eastern knowledge, and the advanced state of civilisation and medicine. "When indisposed," we are told, "they (the Greeks) applied to their sophists (Brahmins), who, by wonderful, and even more than human means, cured whatever would admit of cure." * This knowledge of the healing art was acquired by the sagacity of the race, their accurate observation, and care in applying the

*Supra vero major vis ingruat, sophistas consulere, eosque non sine divinâ quadam virtute, quicquid medicable est curare. Arrian Rev: Ind. liber. ii, vol. i., p. 639.

means of preventing and curing disease; and was exercised for promoting health, assuaging pain, and prolonging life.

The peculiar and most ancient system of Hindu medicine, the *Ayur-veda*, appears to have been prepared not long after the Aryan race had descended into the fruitful plains of Hindostan, and it evinces the extensive knowledge and power of generalisation, for which the race was so remarkable. Being soon separated into small states, their medical observations were collected into different works founded on the original system, without following exactly the same course, nor adopting the same method of healing. This was so extensive, that one branch was more attended to, in these works, than another, according to the circumstances of each state, and the genius of the writer. A variety of opinion was to be expected in each of these systematic works, prepared by different individuals, and with little communication with each other. These scientific stores, of the experience of the Asiatic nations have only lately been examined, and the ancient "learning of the east" is found to be extensive and accurate: their sciences being combined with their philosophy, and interwoven with their religious systems, and are found to have enlightened the other Asiatic states as well as the European nations.

The repugnance the ancient Hindus had to mingle with other nations, and their pride of race made them disdain to borrow from other countries, or add to what they believe had been specially revealed to them by God. We thus explain why the knowledge displayed by the Hindu systems never reached an excellence beyond the means they possessed of gaining it at home; and why their descriptions, their similes, and their medicines, are all derived from their own country. They had no peculiarities in their philosophical opinions, and particularly in their systems of medicine, to prove that they had borrowed either from any other people.

In the following work, a description will first be given of the ancient Hindu system of general and special education. The first was protracted by acquiring the rules of grammar by rote, without sufficiently exercising the reflective faculties; while the special education was peculiarly practical, combining experiment with observation and inductive reasoning, according to the interrogative method. Leading a pure life, and accustomed to observe, to think, and to reason, the Brahmins avoided idleness, and despised riches. The student proposed questions on important and difficult subjects, which were answered in an aphorismatic manner by the

teacher. The art of writing may not have existed in the vedic age, or the Hindus may have used symbols, or hieroglyphics, as a rude assistance to their memories. When they had the advantage of a written language, their grammar, ethics, and medical precepts were written in rhyme, which they stored up in their memory; and to give authority to these ancient maxims, a divine origin was assigned by the ancient Hindus to the *Ayur-veda*, or original system of medicine, which, they stated, was abridged by inferior deities, and conveyed to weak and sinful man by holy sages, who established schools for the instruction of youth in the study of particular branches of science, to which they were directing their attention. This admirable system of practical education among the ancient Hindus, appears to have been nearly identical with that of ancient Greece. The eastern sage delivered his instructions under the shade of a spreading sacred tree, and the ancient Greek, on account of the climate, in a gymnasium or academy; the sage answering the questions on difficult subjects proposed by his distinguished students. Thus they discussed the nature of man, of the soul, the precepts of health, and the nature and treatment of disease. The western sage (Plato) discussed with his pupils, what is temperance, or self-restraint, or

moderation, method or sobriety? or rather, what is the natural object of the sentiment? What is law, virtue, knowledge, &c.? All these dialogues are designed to investigate and determine definitions. If we consider the method, the subjects discussed, and the dialectic teaching of Charaka, the resemblance is most striking;* both discoursed on the immortality of the soul, the one with Agnabesa, the other with Echecrates and Phædon. Socrates is considered the first who distinctly taught in Europe that men have souls; the inward invisible *cosmos*, that lies deeper than sense, and the heavenly guide or dæmon, were admirably described by the ancient Hindus. Both eastern and western philosophers insisted on the importance of self-knowledge or wisdom, and both works afford a remarkable fund of useful and most important, as well as difficult knowledge, embracing discoveries which are supposed to have been made two thousand years afterwards, and opposing doctrines still supposed to be new. It is unfortunate that the age in which these ancient philosophers flourished and their works were prepared, is not exactly known.

The progress made in the knowledge of the Sanscrit language, by the aid of the other Indo-Germanic tongues, discovers many new and im-

* See specimen from Charaka, vol. i. p. 44, et sequ.

portant facts regarding the import of the literary and scientific words of the Hindus, as developed by the labours of Sir William Jones, Lassen, Professor Wilson, Max Müller, and many others. The boundless field thus opened up attracts and stimulates, while affording to the intelligent archæologist increasing facilities of study, and the means of discovering the age in which their ancient works were written

Europe is indebted to the Greek writers for much fragmentary knowledge of ancient India; but it wants fulness and precision, and we must look to modern authors for solid instruction. Sir William Jones is regarded as the illustrious pioneer of oriental studies, and it was an important discovery of his that Sandracottus of the Greeks was the Chandra-gupta of the Hindus, as it gave us a date of much importance, from which we could calculate events about the same period. It is now generally allowed that the sacred hymns, prayers, and precepts, forming the Vedas, were first preserved by oral tradition, and were therefore called *srutra* (that which is heard); were compiled by Krishna Durpayuna Vyas, B.C. 1400;* and

* Mr. Colebrooke arrived at this conclusion from a passage from Iotysh, one of the Vedas, where the northern solstitial point is reckoned to be in the middle of Aslesha, and the southern at the beginning of Sravishta or Dhanishtha; and then declares, what he had elsewhere shown, that "such was the situation of those cardinal points" in the fourteenth century B.C. —*Asiatic Researches, vol.* viii. *p.* 487.

were followed by brahmana, or speculations on their meaning, while the Upa-vedas, or treatises in general literature, are not traced higher than B.C. 900, when the laws of Manu, and the *Ayur-veda*, or ancient system of medicine of the Hindus, were arranged. Hessler supposes the work to have been prepared at an earlier period.* Fragments only of this work are now procurable (see p. 36); and it is to the commentaries prepared by Charaka and Susruta on the Ayur-Veda, or compilations from other sources, that we owe the two great systems of the ancient Hindu medicine, which have come down to us.

Both these systematic writers are distinguished by their knowledge of the profession, and great judgment in the treatment of disease. At that early period of civilisation there does not appear to have existed a permanent Hindu school. Each of the small states, of which Hindostan was made up, had its own independent laws and usages, which accounts for the author of the one system not referring to the other; and their literary and scientific works proved a like independent condition.

As the result of the above remarks, it appears

* Ex omnibus hujusque allatis valde fit probabile Susrutæ Ayurvedam mille annos ante nostram æram jam exstitisse. Comment et annot: in Susr: Ayur-vida. a. F. Hessler, 1852, p. 4.

that, at a very early age, the Hindus had made a much greater progress in civilisation, and the arts and sciences, than any other ancient people; and that while the nations of the west have been slowly advancing in civilisation during the last two thousand years, the Hindus, by the depressing influence of foreign subjugation, are at present in a much lower social condition than they were in three or four centuries before the Christian era. It was most probably at this early period that they had studied the healing art with a success which enabled them to record systematic works on medicine, based on that practical knowledge which the prejudice of mankind is so much opposed to. Susruta informs us that a learned physician must combine, a knowledge of books, or theoretical knowledge, with the dissection of the human body, and practice. This explains why the ancient system of Hindu medicine was so complete in all its parts, and so permanent in its influence, and warrants the inference that several centuries were required to form it.*

The Charaka and Susruta must be considered the most ancient existing records of the medical science and art of the ancient Hindus. The latter ranks first in merit, and follows a more systematic

* See Professor Wilson's note on Mill's History of India, vol. ii., page 232.

course. The author having derived assistance from the Ayur-veda and the Charaka, in which there are more practical remarks, and a better arrangement of disease; while the more modern works on medicine, follow an imperfect plan in proportion as they are more modern.* Professor Wilson supposed, † "that from the Charaka and Susruta being mentioned in the Paranas, the ninth or tenth century is the most modern limit of our conjecture; while the style of the authors, as well as their having been the heroes of fable, indicate a long anterior date." The Charaka and Susruta must have been prepared in a very early age, probably from the third to the ninth or tenth century before the Christian era. This conclusion is arrived at from the following considerations:

1. They were written in the most ancient form of construction of the Sanscrit language. 2. They were considered to be the production of divine beings, and mentioned by ancient authors. 3. These medical works must have been written at a time when there was no prejudice of caste; and when looking at the sun, or stroking a cow was considered sufficient to purify a person who had touched a human bone. 4. In Charaka, the names of the Munis ‡ are men-

* See Sir W. Jones' preface; and Mountstuart Elphinstone's History of India, vol. i, page 427, et seq.

† See Wilson, b.c., p. 26.

‡ See p. 21: also Note on Mill's History of India, vol. ii, page 232.

tioned, who flourished before mythology was introduced into the Hindu system of religion. They had no connexion with the names of their gods, who were afterwards most probably introduced by degrees, as the various objects and operations of nature were deified, and named by their votaries. 5. The authors or compilers of these two systematic works on medicine, appear to have flourished in the heroic age, or previous to that in which the Mahàbhàrata, the great epic poem, was written, as they are mentioned in several places of that work;* which, according to Wilson, was composed about the second century before the Christian era.†

Others give these great works a much earlier origin. From the evidence which they afford of a vast amount of experience, the accumulation of ages, they must be deemed to be compilations from previous works, of which the Ayur-veda may be considered the prototype; and as neither the names, nor traces of the worship of Siva, nor the discipline of the Brahmins, or Jains, are found in them, they may be numbered among the most ancient Hindu works. They are written with clearness, conciseness, and simplicity of arrangement, without interpolation, or modification in detail, and may be

* Nala, an episode of the poem, lib. vi. slok 9; Indalok, lib. iv. slok 9; and the Arjunæ, lib. 2, slok: Cited by Dr. Hessler, 1. c. p. 22.

† Works by H. H. Wilson, vol. ii. p. 336.

regarded as compendiums of the knowledge of medicine possessed at the time. Each work is most probably the compilation of one man, following the same method, and simple style throughout; and in consequence, they are uniform in doctrine. Both mention the names of various ancient physicians, but neither give those that are enumerated by the other, which proves the little intercourse that must have subsisted among the different states at that early period. Both must have been compiled from medical works then existing, and both authors may have lived about the same time, but in different states, supported by different sects, who traced their history to different sources, and arrogated each to itself a superiority not admitted by the other.

The Humoral Pathology, although explained in the earliest and best Hindu writings, is not so particularly dwelt upon, as in the works of a more recent period. The ancient Hindu works contain much information on chemistry, which has been incorrectly supposed to have been derived from the Arabians.* The seventh division of the Ayur-veda, the earliest record of medicine, treats of chemistry (Rosayana); and the ancient Hindûs, in their commentaries on that sacred work, describe many useful chemical preparations for the restoration of

* Kimiya, chimy, chemistry.

health, and for the purification of metals. This knowledge was supposed to have been obtained by divine teaching, and its ultimate object was to prepare an elixir that was to render health permanent, and life perpetual. This explains their numerous receipts, composed of every variety of drug, and their processes for the transmutation of metals from their supposed crude state, to a more pure and perfect form. The neighbouring Asiatic nations profited by these early researches of the Hindus; and the Arabs, who first made them known in Europe, were believed to be the original discoverers; although Geber, being the earliest alchymist known in Europe, is considered as the first writer on chemistry,*expressly states that he derived his knowledge from the works of ancient sages.†

Chemistry signifies the knowledge of the composition of bodies, and the changes of constitution produced in them by their mutual action on each other. From the peculiarity of many of these operations, which man is obliged to perform for his own subsistence, comfort, and defence, and from a multitude of changes of the same nature, which are constantly occurring on the surface of the earth,

* Thomson's History of Chemistry. Preface, p. 3.

† Totam nostram metallorum transmutandorum scientiam, quam ex libris antiquorum philosophorum abbreviamus, compilatione diversa in nostris voluminibus, hic in unam summam redigimus: Geber Alch. cap. 1.

it is evident that the most ancient nations cannot have been ignorant of chemical phenomena; and considering the sagacious character of the ancient Hindus before the Christian era, it may be inferred that the most important science of chemistry did not "spring from delusion and superstition, nor was fostered by deception and credulity," but was the result of careful observation and reasoning. At an early period the Hindu sages knew the properties of a long list of medical plants, and natural salts, were acquainted with the preparation of the alkalies, and the sulphuric, nitric, and muriatic acids, and by bringing them into contact, observed the complete alterations produced in their physical properties and chemical actions. This led them to the belief that all forms of matter were mutually convertible into each other, and that among the metals, iron, lead, tin, and copper were the same, in different stages of purity, and could all be transmuted into gold. The number of metals which the Hindus were familiar with, and their acquaintance with the various processes of solution, evaporation, calcination, sublimation, and distillation, prove the extent of their knowledge of chemistry, and the high antiquity of some of the chemical arts, such as bleaching, dyeing, calico-printing, tanning, soap and glass making, &c. Their intelligence and

delicacy of touch enabled them to weave cotton and muslins of unrivalled beauty, and proving the advanced state of textorial art in Hindostan. These arts were communicated to the Arabs, who were arrested by the result of some chemical experiments, and tried to discover the great elixir, or philosopher's stone, by which they might lengthen life to an indefinite period, and change the baser metals to gold. Their knowledge, however, was obtained from the more scientific works of the ancient Hindus, and as the originals were unknown in Europe, the Arabians got the credit of being the discoverers. It is hoped that the following review will restore to the Hindus the credit which historical evidence so plainly declares to be their due.

In the sixth century before the Christian era, the ancient and distinguished Hindu philosophers were, for a time, supplanted by sectarian Bhuddhists, who adhered with zeal to the new principles of their belief. They rejected all worldly concerns, avoided politics, depended on open-handed charity for their living, and were always ready to enlighten the ignorant and succour the needy. They retained an intellectual character, inculcating piety to God, and charity to each other, with a love of union and self-government. Their habit

was monoganic, the female having an equal share of the property and duties of the household. The offspring were reared under the care of an intelligent mother, and became an independent, truthful, reasoning being, with self-respect and moderation that placed a curb on the passions. This remarkable sect cultivated medicine with great success; and their philosophical Emperor Asoka, applied many of the ancient Hindu medical precepts to practical purposes; and Buddhist priests translated the medical works into other Asiatic languages. The contest between the Brahmins and Buddhists began in the third, or before the eighth century; and the utter extermination of the latter in India took place between the twelfth and fifteenth centuries.

It is probable, during the unsettled state of Hindostan, the great celebrity of its sages, led to a frequent and intimate connexion with their neighbours in Tibet and China, during which Sanscrit medical literature was introduced during the eight first centuries of our era * It has been stated that five hundred Buddhist missionaries proceeded from Kashmere to China about the Christian era, and by their zeal and enthusiasm, so modestly and judiciously did they act, that

* Calcutta Asiatic Journal, vol. viii. p. 685.

they rapidly converted a large proportion of the Chinese nation to the fascinating Fo, or Buddhist religion.

In the Tamul language, the Hindu works on medicine were translated at a very early age, by Maha Rishi Aghastier, as he is named in the Ramaryana. It is the oldest medical work most probably in their language, as Charaka and Susrata are of the Hindus (H. H. Wilson.) Like other Asiatic works, the commentator begins with an account of the climate, situation, soil, &c. He is particular in his descriptions and directions regarding the proper time of the year for collecting plants, the mode of gathering and preparing them, their doses, and method of prescribing them. He has great faith in *diet*, and is careful in his directions regarding different individuals and diseases.

Egypt appears first to have profited by eastern learning, which they imparted to the western branch of the Aryan family of man, inhabiting the shores of the Hellespont and the Ægean Sea; and in union with the Pelagic, Turanian, and Celtic races, distinguished themselves as the Hellenic nation, by producing the most advanced branches of the arts, science, and philosophy. This western Aryan race carried with them from the east a lan-

guage already formed, and perfect in all its parts (Max Müller); and when such was the case with so artificial a matter as language, it must be believed that they also brought with them much more than the rudiments of knowledge; an acquaintance, for instance, with forms of disease, and the remedies suitable for their removal, almost as indispensable in man's necessitous state, as the means of procuring his daily food, and satisfying his other wants. Besides, the number of Sanscrit words in the Greek authors affords incontestable proof of the early connexion between the two countries. So marked was the resemblance in other respects, that it led the able Niebuhr to conclude that the Greeks had derived much of their architectural and philosophical speculations from the oriental mind; and many medicines produced in Persia and India were employed by the early Greeks, and could only have been procured from the East. Greece must, consequently, be considered not the parent, but rather the nurse of the arts. Her travellers visited Asia and Egypt in quest of knowledge, and as they had few opportunities of translating records, contented themselves with accumulating oral information, which, on their return home, they imparted to their countrymen. The eastern

science, which was in part received through Egypt, must have been obscured by the distinctive religious and philosophical ideas of that country; while the intelligence of the Egyptians, their mysteries, their stupendous monuments, and their advancement in civilisation, led the Greeks to consider them as the first instructors of mankind, without any reference to the eastern source from which so many of their ideas were originally obtained. Plato informs us, with just pride, that "whatever we Greeks receive from the barbarians, we improve and perfect;" and with their exquisite feeling for beauty and proportion, majestic simplicity of form, truth and purity of expression, the ancient Greeks formed systems of philosophy and medicine. It was her higher constructive and æsthetic qualities, as much as her scientific knowledge, which placed Greece above all other western nations; and this advance made by the Greeks was considered as original by the rest of Europe: their first mental efforts being regarded as divine revelations. Certain it is, that the philosophers of Greece greatly advanced many sciences, which had originated elsewhere, by creating for them a language now in universal use.

We know the people, and are familiar with the distinguished individuals, who have added to our

medical knowledge in Europe, and can prove that their different systems have a common source, being originally derived from the family of Hippocrates. One of these great benefactors of mankind, combined, and reduced to a systematic form the accumulated experience regarding the nature and treatment of disease, which has ever since been of such great advantage to suffering humanity, and is still held in high esteem. This great physician is still called by Europeans *the father of medicine*, and by the Egyptian Saracens, *the king of health*, and our admiration of him has led the moderns to suppose that, with some hints from the Egyptians, the Grecians were the originators of both the medical science and art of Europe. A more extended knowledge of history proves that this is not correct, their own most ancient records proving that they obtained much of their knowledge from a mysterious nation of the east, which we have proved was the Hindu, among whom the arts and sciences were successfully cultivated, and whose great progress in medicine attracted attention, and was communicated through the Egyptian priesthood, to the philosophers of Greece.

With this assistance, the Greeks arrived at the most celebrated period of their history. It

was the age when Pericles, the famous politician, lived; when Æschylus, Sophocles, Euripides, Aristophanes, and Pindar, among the poets; when Socrates, and his distinguished disciples Plato and Xenophon, among philosophers; when Herodotus, and his young rival Thucydides, among historians; and when the unrivalled statuary Phidias, with his illustrious pupils, flourished in Greece. It was only a few years before the dawn of Grecian celebrity, that the great Confucius and Zoroaster formed eras in oriental history.

During this remarkable age of Greece, Hippocrates distinguished himself, and like the great mythical heroes of antiquity, he is said to have been descended from gods and princes, and his mental faculties to have been developed under the direct influence of the Deity; by which supposition, the extent of his improvements, and the accuracy of his supposed productions were explained by the vulgar.

Without entering into such mythological fables, it is sufficient for us to know, that medicine, in that enlightened age, was appreciated as a science of the greatest importance to man. It was advanced at first there, as elsewhere, by a succession of men of genius, working in a proper direction, in the wide field of nature; each step in improvement being

the result of its predecessor, and excellence depending upon successive innovations, which were often separately slight in themselves, but produced a total revolution in the end, so that the features of the parent could scarcely be recognised in the offspring. Facts were thus accumulated in medicine by the thoughtful priest, the observant physician, the skilful surgeon, the sagacious layman, and the experienced matron, who had left to their successors their legacy of thought and skill. These were the source of the knowledge which immortalised Hippocrates in the west, and the Hindu systematic writers of the east, and has afforded assistance to mankind in retaining health and curing disease. The historian traces a system from one country to another, and notes the individual who imparts to it that stamp of genius, by which the borrower becomes the originator. Such was the great Hippocrates. Medicine was first cultivated in Greece by a succession of able men, placed in favourable circumstances for accumulating knowledge, and assisted by the labours of physicians of other nations. Such an accumulation of facts enabled them to arrive at principles, which were systematised by Hippocrates, and formed a text book of medicine for the western world.

We hold this to be the true and rational explanation of the sources from which the works ascribed to Hippocrates were compiled. Many of them are now allowed to be spurious, and the remainder contain such a body of facts, as no individual could collect, with the greatest industry, and the most gigantic capacity, under the circumstance in which he was placed in Greece. Such a system could only have been formed by the long continued efforts of many inquirers. As Hippocrates has not made any acknowledgment of such assistance, it may be interesting to consider what he could have derived from the labours of his predecessors and from other sources.

1. The assistance from records left by the sick in the temples must have been but scanty and imperfect. Those who resorted to these temples were ignorant of disease, and of the remedies employed. I have known such temples in Asia, under much the same circumstances as those of Greece; and I found patients resorting to them for tedious, painful, and loathsome diseases, of the nature of which the priests were ignorant, being satisfied with following certain forms and ceremonies, and prescribing rules and simple remedies. In such temples the priests kept no records.

2. Hippocrates must have derived great assistance from the experience of practical and sagacious predecessors. Their habits of observing the numerous sick who resorted to the temples, and of travelling for the acquisition of information, would enable them to examine and describe the course and peculiarities of disease in different countries and climates; by which means they obtained much medical information, such as the resources of the small island of Cos could not impart.

3. To their recorded experience, he added a long life of study in his own and other countries, where he is stated to have obtained much information from the experience of distinguished living physicians, during the twelve years he is said to have devoted to travel. In this time he visited several Grecian states, copied such medical tables and records as the priests had accumulated in the temples dedicated to Esculapius, of Diana at Ephesus, and other establishments. It was in Greece he is supposed to have collected most of the information regarding epidemic diseases; and by condensing experience, generalising facts to suit the people and the country, attained the great merit of an original author Galen mentions that Hippocrates was often at Smyrna in Asia Minor; and Mercurial believes that he travelled in Lybia in

Africa, and Scythia in Asia. What could have induced Hippocrates to visit this distant and inhospitable northern country, unless it was the fame of the enlightened and skilful people of the Indo-Scythian country, whom Alexander the Great knew as being so expert in the cure of disease? In the northern parts of Hindostan he might have consulted the Hindu sages, and learned their medical records, either in a direct or indirect manner. This is a reasonable supposition. The learning he was in search of was known to be there; and the examination of his works prove an acquaintance with their learning and knowledge.

a. That systematic works on medicine existed at a very early period in Hindostan must be allowed; and we have seen that the most learned orientalists suppose these were compiled from the third to the ninth or tenth century before Christ. Indeed much medical knowledge existed in India long before the time of Hippocrates, as the ancient Sanscrit authorities refer to an original *Ayur-veda*, from which the other two classical works were compiled.

b. The fact that medicinal plants have their peculiar properties developed in particular soils and climates, indicate us to the nations in which they must have been first used for medicinal pur-

poses, and will explain the antiquity of the cultivation of medicine by certain races, and even the countries from which particular races came. The sacred soma plant is found only in the high mountainous countries in the north-west of Hindostan; and as the sacred wine required for sacrifice was prepared from the recent plants, which do not bear transportation, it must have been employed by the Aryan Brahmins in worship before they descended into the fruitful plains of Hindostan. The names and kinds of medicine recommended in medical works indicate the schools of medicine from which they were borrowed. It may thus be shewn Hippocrates derived assistance from the Hindus, from the number of Indian plants imported from that country into Greece, mentioned in his Materia Medica, and used for their well-known properties by the Greeks: such as Sesamum Indicum: Lin; hyperanthera morunga; cardamomus, amomon, laurus cinnamomum; Valeria Jatamansi; Boswellia thurifera, &c. There are also black and long pepper, ginger, cassia, spikenard, calamus aromaticus, which are all products of India, or the neighbouring countries.

c. The internal evidence of the works ascribed to Hippocrates seems to prove them to have been compilations, derived in part from other nations

further advanced in the knowledge of the healing art than the Greeks. The Hindu surgeon performed the most difficult operations, such as the Cæsarian section, embryotomy, lithotomy, &c. The first description of the last operation in the works of the western authors is by Celsus,* who mentions the names of two Egyptian lithotomists, and may have derived his information from that country. This is more probable than that it was from the Persians and Arabians, who attended little to surgery, and who even, during the most enlightened period of Arabian history, were so prejudiced against the operation of lithotomy, that *Avenzoar*, their most able surgical writer, considered it one which a respectable physician would not witness, far less perform.† Opinions such as these, must have been founded on the fancies and luxurious prejudices of the Arabians, who, through obtaining much knowledge of the medical profession from the Hindus, adopted only what was suited to their own wants and prejudices, and rejected what was opposed to these, and beyond their knowledge of anatomy.

The duty of the physician to his patients, is to alleviate suffering, under all circumstances of habit

* De Re Medicâ: lib. v., ch. 26.
† Taisir, Lib. ii. tr. vi., ch. 1. f. 30.

and custom. But this was not recognised by Hippocrates; for the oath* which was taken by the student on entering the profession, interdicted the novice from the performance of the operation of lithotomy, which was left "to men who were special practitioners of this operation."† Surely there is here a proof that the author's knowledge of anatomy and surgery had been derived from a more enlightened and skilful nation, and was imperfect compared with that of his teachers. This accords with the scanty knowledge of Hippocrates in anatomy; and his crude and imperfect ideas of physiology and surgery; while his extent of practical knowledge of medicine, collected from able practitioners, accounts for an analogy of sentiment and opinion in the Eastern and Greek systems; while the former is simpler in its first principles, and truer in its reasoning, than the more fragmentary occidental system. Many of the practices of the west were manifestly derived from the east, and in Hindostan we still find the customs, and witness the ceremonies, which characterised the pagan times of Europe.

* Le Serment est, par la beauté de la forme et par l' élévation des idées, un des plus précieux monuments de la littérature Grecque; c'est la pièce la plus ancienne et la plus vénérable, des archives de la famille des Asclépiades. Les autorités les plus imposantes, les preuves les plus irrécusables s' élèvent en faveur de son authenticité—*Daremberg Œuvres d' Hippocrate: Intr. p.* 1.

† Works of Hippocrates, by Dr. Adams, vol. ii., p. 777; Daremberg's Œuvres d' Hipp. 184, 71.

Considering these various circumstances and points of resemblance, it is impossible to divest oneself of the conviction that there were once communities in Hindostan, possessing eminent scholars, who cultivated literature and science, by which the Egyptian and Grecian philosophers profited. Such an early state of civilisation in India reached back at least a thousand years before Christ, and the study of medicine was pursued with success centuries before it could have been so advanced in character, and so permanent in its influence, as Alexander the Great found it in the fourth century, B.C. It is to the Hindus we owe the first system of medicine.

It has been supposed that the Chinese and Egyptians may claim a priority in their knowledge of the arts and sciences, from the remarkable and enduring character of their civilisation; but the recorded history of China does not reach, perhaps, further back than the reign of Chi-Hoang-te-Schiboany, who flourished 240 years before Christ; as the early history of China by Koongfu-tse cannot be depended on.* From a more extended acquaintance with the Chinese records, it is now known that there was an intimate

* See Sir J. Davis's admirable Memoir concerning the Chinese. Trans. Royal As. Society, vol. i, p. 1.

intercourse between China and India before the Christian era, by means of travellers and ambassadors; and at that early period, enthusiastic and intelligent Buddhist priests visited China, taking with them the classical Indian manuscripts, particularly those on medicine.* It is believed that the science of medicine was regularly introduced into China by Chung-ke, only about A.D. 229; for the works before that, extending from B.C. 189 to B.C. 1105 years, treated only of the theory of medicine without prescriptions.†

The Egyptians were better known to Europeans than the Chinese by their geographical position, history, and splendid monuments. These, in their chief architectural features, clearly indicate a Hindu origin.‡ The Egyptians most probably derived the rudiments of their learning from the East. There Herodotus and Diogenes, Laertius and Plutarch learned what they taught in Greece; where it was studied, perfected, extended, and promulgated in the West. The chronicles found in the temples of Abydos and Sais, and transmitted to us by Josephus, Julius

* M. Klaproth's tables of Buddhist chronology, translated from the Chinese and Japanese authorities, prove the intimate connexion that existed between India, Tibet, and China, for the first eight centuries of our era. Journal of A.S. Calcutta, by James Prinsep, vol. v., p. 685. November, 1836.

† Royle's Lectures, p. 67.

‡ Forbes's Oriental Memoirs, vol. i., p. 282.

Africanus, and Eusebius, testify that the religious systems of the Egyptians proceeded from India. This is how the temples of upper Egypt are of greater antiquity than those of lower. Their religion, too, descended from Ethiopia and Meroë; to which country it appears to have been brought from India, as stated by Herodotus, Plato, Solon, Pythagorus, and Philostratus. This is likewise supported by the fact that both religions proceeded from monotheistic principles, and degenerated into a polytheistic heathenism, of a symbolic character. Both the Hindu and the Egyptians had the conception of a trinity, combined with that of the unity of the Godhead. They had the same mythological names, and alike believed in the pre-existence of the soul, its emanation from the divine essence, its transmigrations into other bodies (metempsychosis,) and its ultimate return to its divine source. The similarity is seen also in the division of the people into four castes, the form and structure of temples, and many of the symbols and titles of deities, which are the same in Egypt and in India. The incarnation of Mahabad, like that of Manu, and the dread of polluting the sacred river, are points of resemblance; the wanderings of Rama and Krishna resemble those of Hercules and Bacchus, and the journeys of these latter to India

are significant: again, the sphinx, the Vermiis Larus, resemble the avatars of Vishnu in the form of a boar, &c. These resemblances can only be explained by an intimate intercourse between the two nations, at a very remote period. The Hindu *Purans* assert that a mission was sent to Ethiopia and Egypt, which conveyed their sacred vedas and yackshei letters.* The mission settled in the fertile district of Meroë,† which accounts for the identity of the Nagre and the Ethiopic alphabets; both being founded on the syllabic system, and both being written from left to right.‡ The conquests of Sesostris in India, (circa B.C. 1500), and his devastations there, may explain his deification as the *woolly-headed* Buddha, and the similarity in structure of many Hindu and Egyptian temples. The Brahmins assert that Pythagoras and Zerdusht were their disciples.‖ This connexion is more easily understood from the early intercourse which subsisted between Iran and India, which explains the resemblance between the religion of the ancient Persians and Hindus, both being derived from the same source. Sir William Jones has remarked, in the

* Jones's works, vol. vi. p. 445.
† Wilford's Asiatic Researches, vol. iii.
‡ Jones's works, vol. i. p. 115.
‖ Howell's historical events relating to Bengal, vol. ii. p. 25.

Shah Nama, that Ferdusi states Kykasos, one of the kings, was a Brahmin, and explains the resemblance between the Zend and the Sanscrit languages, and between their respective manners and customs; while the Zend people had no trace of science, art, or civilisation, at an early period.

Other testimony might be adduced. Thus Sheikh Abu Soliman, the logician, informs us that Ibn Ady, his teacher, a distinguished physician and philosopher,* assured him that the Indians possessed sublime ideas regarding philosophy; and believed that the sciences were transmitted by them to the Greeks.†

We know from Scripture, as well as from other sources, the extent of the commerce of Egypt and the west, with the shores of the Indian Ocean, whence they obtained gold and silver, precious stones, ivory, muslins, spices, and various medicines; with live animals, such as apes, peacocks, lions and tigers, and even elephants. It is probable that the connexion may have been at first by chance from small coasting vessels getting beyond the land and sea breeze, and being caught by the monsoon, and wafted to the opposite continent. Dr. Miller has related two such instances:

* Died at Bagdad, A.D. 974.

† See Ibn Ady Ossaebeah's History of Med., translated by M. Sanguinet; Journal Asiatique, pour mars avril, 1854, p. 230 et 264.

while Annis Plocamus, farmer of the revenue of the Red Sea to the Emperor Claudius, was coasting along the Arabian gulf, where it joins the ocean, and venturing too far from the shore, the ship was taken up by the monsoon, and transported, without stopping, to the island of Ceylon.* In like manner, P. Luigi Maria de Gesu, a Carmelite, afterwards Bishop of Usula, and apostolic vicar of the coast of Malabar, coming round Cape Comorin, in a native ship, was carried over to the Maldives, and thence to the shores of Africa.† From these facts we can understand that a coasting trade existed between India, Egypt, China, and Japan at an early age, and conveyed the riches of the East to Alexandria, whence they were distributed through the Roman empire; and towards the beginning of the sixth century, the Persians were the medium of an active silk trade. This intercourse explains many points of similarity among these eastern nations.

The able Chevalier Bunsen considered himself justified in concluding, from his profound study of the Egyptian language, that it presents indications of a strictly historical connexion with the Semitic and Japetic groups, and that it consequently must have been of Asiatic origin, its divergence hav-

* Vincent's Commerce and Navig., vol. i. p. 45, ss. Pliny, lib. vi. 22.
† Paolin p. 83.

ing taken place at a period when as yet those two groups had not become isolated from each other.

The Hindus have a similar opinion. "The Rajah of Kishnagur," writes Mr. Halled, "who is by much the most learned antiquary that Bengal has produced within a century, has very lately affirmed that he has in his possession Sanscrit works, which give an account of a communication formerly subsisting between India and Egypt, wherein the Egyptians are constantly described as disciples, not instructors, and as seeking that liberal education and instruction in the sciences of Hindostan, which none of their own countrymen had sufficient knowledge to impart."*

The records of Asiatic history are indeed scanty, being chiefly modern, and are confined to the relation of the crimes and misfortunes of our fellow-creatures, or the panegyrics of great families, with exaggerated accounts of supernatural and often revolting feats of heroes, the devastation of wars, and the conquest of great empires; while literary genius and scientific discoveries are alike neglected, and the progress of social improvement,

* Grammar of the Bengal language. Hooghly, 1778. Pref. p. 5. In 1835, I had an opportunity of enquiring of one of the unworthy representatives of the rajah regarding these interesting MSS, but he could give me no intelligence on the subject. A search was made among the few MSS. which were in his library, but no such works could be found.

and the mental creations of distinguished men, are considered beneath the province of the historian.

In tracing the progress of philosophy among such a people, it is necessary to observe, that human nature exhibits a general resemblance among all nations; while the absence of absolute identity is accounted for by the influence of race, climate, habits, customs, and political state. Hence there exists a certain similarity in the general speculations of different nations, which, however erroneous and different in many respects, must be acknowledged to have the same foundation, as regards the facts upon which they are based. This will be pointed out in the following work, and will be of use as leading to a more exact definition of particular opinions. Doubtful points in medicine may thus be illustrated and established, and distant analogies between tenets detected, which will corroborate the testimony of history, and lead us to compare those first principles upon which systems are founded.

The Aryans thus reduced medicine to a system of rules in Asia and Europe, which, from their originality, truth, and excellence, have formed the most ancient and useful groundwork of medical practice in the civilised world. These deserve our

* Ed. Review, vol. xix. p. 143. † Elphinstone, vol. i. p. 250.

first consideration, as the prototypes of so many others; and as the primitive system in Asia has fallen into neglect, and has not generally been recognised by western authors, I have described it at greater length than I should otherwise have considered it necessary to have done.

It was in Málwah, in central India, that the first Rajah Vikramaditya flourished. This great conqueror resided in his capital Ujein fifty-six years before Christ; some suppose at a much earlier period.* He ruled a civilised and prosperous country, encouraged learned Brahmins, and was the most distinguished patron of letters among the Hindu kings, after the expulsion of the Buddhists from India. In the metaphorical phraseology of the Hindus, then flourished the "nine gems" or nine learned men, of the court of Vikramaditya, who formed the golden age of Hindu learning and the arts; because of the original works, in all the sciences, which they produced. They were Dhanwantaree, Kshapanaka, Amara Sinha, Sanku, Vitalabhutta, Ghatakarpara, Kelidasa, Varahamihira, and Vararuchi. These celebrated men indeed produced able works in the various departments of know-

* Asiatic Researches, No. 111: p. 242. Wilson's Sanscrit Dictionary, Preface. Works, vol. v., p. 167. See Sir John Malcolm's Central India.

ledge; but some of them appear to have lived at distant periods, and not properly to belong to this era. Some of their writings are still preserved. The first, Dhanwantaree, was a great physician, although not the author of Susruta.* Amara Sinha was author of a metrical lexicon, which still enjoys a high reputation; Varahamihira is supposed to be the author of the Surya Seddhanta, or famous versified treatise on astronomy and geography; Vitalabhutta was the reputed author of Pancha-vingshata, a well-known work full of popular legends; and Kalidasa was the great poet.

In the beginning of the first century, the intercourse was more intimate with the East during the Roman wars, and was increased when the Emperor Valerian was taken prisoner by Sapor I. (in A.D. 262). The marriage of Sapor II. with the daughter of the Emperor Aurelian, and the encouragement he held out to learned men in the east, induced many to establish themselves in the city Nisabur (Jondisabour) which he had made his capital. Thither the learned Greek philosophers and physicians resorted, and it became celebrated as the medical school where Rhazes, Haly Abbas,

* In Asia, "the celebrity of any particular denomination is the cause of its being assumed by many besides the original possessor."—Prof. Wilson's Works, vol. v, p. 174. Ward's Hist. of the Lit. of Hindus, p. 49, vol. i.—London.

and others, were educated. The banishment of the able Nestorians of the west by the orthodox Christians, tended to the spread of knowledge; and the dispersion of the school of Edessa, and the expulsion of the Athenian Platonists, by the Emperor Justinian, led many to seek an asylum in the great Persian court, where much encouragement was held out to them. In the reign of Chosroes, as Friend* informs us, Damascius the Syrian, Simplicius of Cilicia, Diogenes of Phœnicia, and Isidorus of Gazi, &c., retired into Persia; and in the time of Mohammed, Dr. Moore states that Hareph-ebn-Kaldaht, a pupil of the school of Jondisabour, came to Mecca, where he settled, and was commended by the prophet for his medical skill. He was afterwards appointed physician to his successor, Abu Becker; rose high in his personal favour, and was poisoned along with him.†

From these historical facts a continued intercommunication appears to have existed between the Greeks, Persians, and Hindus, from the time of Ctesias, in the fourth century before, to the sixth century after our Saviour, which explains the similarity of their scientific principles.

During the reigns of the Seleucidæ and their

* History of Medicine, vol. i. p. 133.
† Moore's Ancient History, p. 202. Abulfeda; Annal: Moslem. vol. i. p. 220.

successors, the Persian kings kept up an intercourse with both Europe and India, as is indicated by the coinage of their states. At first the coins were purely Greek, and were succeeded by others having a Greek inscription on one side, and a Pehlevi on the reverse. Native designations in Greek characters were then substituted for the Greek titles; and the Greek characters continued in use till the fourth century in the provinces of Cabul and Punjaub.*

One commentary, on the text of Susruta, made by Ubhatta, a Cashmerian, is probably as old as the twelfth or thirteenth century; and this commentary, it is known, was preceded by others.† Dr. Royle, in his "Essay on the Antiquity of Indian Medical Science," has cited passages from the Latin translation of Rhazes and Serapion, in which the Charaka is mentioned. He found that the chapter on leeches, by Avicenna, acknowledged his obligations to Indian authority, by stating "Indi dixerunt;" and that the description was word for word, that of Susruta on the same subject. Gildmester, of Bonn, commenced a work in 1838, entitled, "Scriptorum Arabum de rebus Indicis loci et opuscula inedita," from the bio-

* Asiatic Journal, vols. 3, 4, & 5.

† Professor Dietz states that the Greek physicians were acquainted with the medical works of the Hindus. The Arabians were familiar with, and extolled the healing art as practised by the Indians. (A.D. 773.)

graphical work of Ibn Osaibiah, who lived at the beginning of the thirteenth century, and died A.D. 1269. This book was translated by the Rev. W. Cureton, and is accompanied with some remarks on the names which occur in the preceding note by Professor H. H. Wilson. He is of opinion that the Arabians of the eighth century studied the Hindu works on physic, and preferred their medicines, before those of the Greeks; and that the Charaka, the Susruta, &c., were translated and studied by the Arabians, in the days of Harun-el-Rashid and Mansur (A.D. 773), either from the originals, or more probably from translations made at a still earlier period, into the language of Persia.* The same author shows that the Arabians extolled the healing art, as practised by the Indians, quite as much as that in use among the Greeks. †

Baron de Sacy, in his account of the Sanscrit origin of the Fables of Pilpay, states that they were first translated from the Sanscrit, in the sixth century, by the physician Barzouyeh, who had made two journies to India, for the purpose of learning the Sanscrit language, and procuring Indian books

* See the remarks, by Professor Wilson, on the Indian physicians at the court of Bagdad; and by the Rev. W. Cureton; Journal of the R. A. Society, vol. vi., page 106

† See Professor Dietz Analecta Medica: Leipsic, 1833; Journal of Education, vol. viii., page 176.

as well as medicaments and herbs. He was sent there by the Persian king Nuserwan, who reigned in the middle of the sixth century, encouraged learning, and is said to have been the first who introduced the Grecian philosophy into his court.* At this period there appears to have been a constant intercourse between India and Persia, and between Persia and the Greeks, and the latter Greek authors must have become acquainted with many Indian products. Paulus Ægineta, who lived at the end of the sixth and beginning of the seventh century, has several compounds named Indian. Aëtius, who flourished at the end of the fifth century, mentions nuces indicæ, cocoa nuts, zador, gedoary, and galanga, santalum, sandal-wood, the fruit of the Semecarpus anacardium, and an antidote of two kinds of pepper, which indicates much knowledge of, and employment of Indian products.

"It is clear," writes Professor Wilson, "that the Charaka and Susruta, the treatises called Nedan, and other medical *pourans*, treating of diseases of women and therapeutics, were translated from the Sanscrit, and studied by the Arabs in the days of Harun and Mansur, either from originals, or probably from translations made at a still earlier

*Dr. Royle's Lectures, p. 73.

period into the language of Persia;" and that able and cautious writer concludes "that the astronomy and medicine of the Hindus was cultivated by the Arabs of the eighth century, previous to their studying the works of the Greeks."

The celebrated Arabian physicians, Rhazes and Avicenna, mention from sixty to seventy Indian medicines, which they recommend in their works.* The trade in these drugs formed a portion of the commerce which was carried on between these countries, and among them assafœtida, and perhaps some of the other fœtid gum-resins, formed a part of the return which Persia made for the spices and aromatics of India.

These medicines are frequently mentioned, in Europe by their Indian names, and may have been obtained at an early period by commerce up the Persian Gulf to Bagdad, and by the Red Sea to Alexandria. At a later period, when the enthusiasm of the conquering Mahommedans subsided in Asia into peaceful inactivity, medicine and philosophy attracted the attention of the Caliphs of Bagdad, and they encouraged the study of the sciences, and the means of preventing and curing disease. They discovered that many might be relieved from pain, and made wiser by

* See British Medical Review for 1847, p. 528.

the labours of a few; and they required the knowledge thus acquired to be imparted in their own language. Harun-el-Raschid, and Al Mansur, the great patrons of the school of Bagdad, encouraged the connexion and importation of drugs from the East. There are no medicines mentioned either in Charaka or Susruta, which grow in Greece, or Europe, and not in India; nor could I find, after a careful enquiry, any ancient scientific work translated into the Sanscrit language; while numerous works might be cited, translated from it, into different neighbouring languages.*

The local governments which ruled the different states of modern Hindostan had each their respective philosophers and physicians, who prepared works of more or less ability, according to their character and attainments, and the peculiarities of their countries. Some of these are original, while others are more modern and in various dialects. The successors of the ancient Hindu physicians, from neglect and changes of government, lost much of their superiority. The medical works of the Hindus of Bengal and the northern pro-

* The Arabic translation of Susruta is entitled Kelale Shawshoor-al Hinde; see the 9th vol. of the Trans. Med. and Ph. Society, Calcutta, On Arabian Medicines, translated by Springer. Ainslie's Materia Medica, vol. ii. Kerr's Review of the rise and progress of the Med. College, in Bengal; Indian Annals of Medicine, sec. 2, ix.

vinces of Hindostan, are either in the Sanscrit, Hindu, or Bengalee languages; and those in the peninsula of India, are in the Tamul, and other Dravidian languages; while the Mahommedan population have their medical works in the Arabic, Persian, or Urdu.

The bigoted prejudices of the ignorant and despotic Mahommedans in India, in favor of their own system, prevented them availing themselves of the Hindu writings, which were supposed to be filled with prayers (muntres) and charms. They considered them sinful (haram), and not worthy of being preserved. Science was forgotten, the schools decayed, works were lost, and theories usurped the place of observation and reasoning. During this age of anarchy and neglect, the Hindu learning was ignored by the Mahommedan rulers, while very inferior Persian compilations were thrust into the position they had occupied. These were filled with frivolous and barren details, and superstitious fancies; and the original Hindu system remained unknown. The descendants of the learned Brahmins were obliged to follow more remunerative occupations, and were reluctant to impart the contents of their sacred shastres to the despised and inquisitive stranger.

This explains the neglect into which these ancient

medical records had fallen, and the contempt with which the European conquerors of Hindostan regarded its scientific medical knowledge. The diffusion of European notions of medicine operated as a discouragement to the study of the Sanscrit works, where the treasures of the Hindu learning were contained, and to the preparation of valuable but expensive medicines. This led to the introduction of inferior substitutes, which diminished the confidence of the Hindus themselves in the prescriptions of their own physicians, and increased the prejudice against the ancient science. A system of superstitious quackery (Bhutaredga) succeeded, which included certain prayers, and the use of incantations, as well as the worshipping of village gods, for the cure of the diseased. This delusion spread farther in proportion as it became more difficult to obtain proper medical assistance to meet the pressing wants of the people. All this explains the present lamentable condition of the native practice of medicine over the greater part of Hindostan.

These fancies had been increased by changes in religion of the Aryan-Sanscrit-speaking race, from simple montheism, to the Siva and Vishnu doctrines, which are distinct and almost antagonistic; and in modern times are both overloaded with a

mass of monstrous and degrading superstitions, and their ancient MSS. neglected and lost.* As the four castes have branched out into numerous others, so the ancient works form a remarkable contrast to the ignorance and superstition of the modern compilations.

As some Brahmins, however, still pursue their spiritual exercises among the people, and a few yugees, or sacred mendicants, lead the same life of privation which their fathers led, and superintend certain religious ceremonies; so some physicians may still be found in cities, and in the service of great families, versed in the ancient medical learning, and pursuing their benevolent efforts to relieve the sick. In a few families the ancient medical works are studied, and the prized manuscripts are transmitted from generation to

* Dr. Springer being appointed to catalogue one of the most extensive collections of oriental works, thus describes the state in which he found these valuable, often unique, manuscripts:—"The books are kept in forty dilapidated boxes, which are at the same time tenanted by prolific families of rats; and any admirer of oriental lore, who may have an opportunity to visit this collection, will do well to poke with a stick into the boxes before he puts his hand into them, unless he be a zoologist as well as an orientalist. At the end of the hall there are bags full of books completely destroyed by white ants. Even new books have not been spared by these destructive insects; nearly the whole edition of the Tajalloghàt has been destroyed; and most of the remaining copies of the Half Qulzum have had the same fate. The number of volumes in this collection is very great, and among them are some Pashtú works, written with great care, for the brave and learned Rohilla chief. It is unfortunately the habit of the king's people merely to count the number of volumes, and to make the librarian responsible for the numbers not diminishing. The consequence is, that many good books have been abstracted, and bad ones put in their place."—*Catal. of Manuscripts in the Library of the King of Oudh, vol.* i. *p.* 4 & 5. Calcutta, 1854.

generation. I have had the pleasure of knowing several such families, and hereditary physicians, rich, independent, and much respected.* Among such individuals, the ancient manuscripts were so highly valued, that the influence of station, rank, and money were sometimes ineffectually exerted to purchase them. In some cases it was difficult to induce the proprietors to give permission to copy them, from their supposed value, and the dread of their receiving injury or being lost. This difficulty was increased by the superstitious belief of many, that all the benefits to be derived from the possession had been bestowed by God upon the individual and his family who possessed them, as a special mark of favour, and would vanish on the manuscripts being sold, or even the precepts communicated to unauthorised persons.

Such peculiarities of the country and profession will explain the contrast between the ancient state of the science, and its degraded condition among the moderns. In general, the European physician who came into more friendly converse with the intelligent Hindu, had little leisure for or was repelled from its study, by the prominence of superstitious

* After some enquiry, I found (circa 1842) there were not more than four or five persons in Bengal who were acquainted with the ancient Hindu Med. Shastres. I believe the number has since been increased.

fancies, and other defects in the modern Hindu practice of medicine. The students of Sanscrit found important information on other subjects in the ancient records of the Hindus, but very rarely extended their examination to the medical shastres, as the subject was not of general interest, and required a professional knowledge with which the modern Brahmins were rarely conversant. When they did study them, it was in a cursory manner, more as a subject of curiosity than utility. They were also more satisfied with recent and imperfect compilations, from often finding it difficult to procure the older and more instructive manuscripts.

It is very unfortunate that those who have expressed an opinion of the learning of the Hindu nation, were not generally aware of the existence of the Hindu system of Medicine, and took so little pains to find out the extent of their knowledge of medical facts, or to test the value of that knowledge, as verified by European experience and modern observation.

This ignorance of the ancient Asiatic science of Medicine explains the opinion expressed of it by learned Europeans. Cœlius Rhodiginus, the instructor of the learned Scaliger, states as the general opinion of his time, "that letters are quite unknown to the Indians," and Sir William Jones's

assertion, "that there is no evidence that in any language of Asia there exists one original treatise on Medicine, considered as a science;" and that "Medicine appears in these regions to have been from time immemorial, as we see it practised at this day by the Hindus and Mussulmans; a mere empirical history of disease and remedies" (Dissertations, Asiatic Researches); thus incorrectly taking the modern practitioner as the type of the ancient physician. Ward alleges, "it cannot be said that their (Hindu) system is destitute of science; but still, the rays shine so feebly, that the student must have been left greatly in the dark, both as it respects the nature of disease and the proper remedies."* "The Indians," writes M. Sonnerat, in his Voyage to the East Indies, "are mostly all pretenders to some knowledge of medicine; that there is not one physician amongst them more learned than another; that they are generally individuals who have been washermen, weavers, or blacksmiths, but a few months before; and, to crown all, that they administer few remedies internally, and make little use of ointments, and cataplasms."† "Even medicine and sur-

* Ward's view of the Hindus, vol. ii. p. 337.
† vol ii, p. 136, English Translation.

gery," writes Mill the historian, "to the cultivation of which so obvious and powerful an interest invites, have scarcely, beyond the degree of most uncultivated tribes, attracted the rich understanding of the Hindus." "The literature of such (nations of India) as affect to be scholars, would appear trifling when compared with the erudition of the generality of boys learning in an academy, for excepting some very small treatises on astronomy, a science of which a few Hindus, residing at Benares, have a superficial knowledge, the whole mass of Indian learning might be committed to the flames, with at least as much propriety as Don Quixote's celebrated collection, and without extracting one deep groan from Parson Adams."* Even in our own time, our ablest politician, and most distinguished scholar, Sir George Cornewall Lewis, whose premature death his nation still mourns, had such a contempt for oriental learning as to state "they have never produced any scientific or literary work worthy of mention, except the "Arabian Nights;"† How contrary is the reality! The ancient Hindu race formed small independent states at an early period, and were in a condition of freedom and independence. But their

* Williamson's Oriental Field Sports, 2nd Ed., p. 118.
† See his Dialogue on the best form of Government, London, 1863, p. 29.

too exclusive devotion to learning and peaceful arts unfitted them for opposing the inroads of ambitious neighbours, who were attracted by their rich country. The Mahommedans repeatedly overran the rich and defenceless plains of Hindostan, ruining the schools, and ignoring the professions, plundering temples, destroying idols, proclaiming a new creed, and requiring submission to their mandate, "you must embrace the Mahommedan faith, leave the country, or become slaves." While bands of plunderers were thus pouring from their outposts in Affghanistan into the heart of Hindostan, mailed hosts of European crusaders were pressing on to Palestine, to rescue the Holy Sepulchre from the hands of the Infidels. This stayed, for a time, the hand of conquest in India; and as the country was restored to order, a great Mahommedan empire was formed, a mutual toleration was practised, and a religious harmony introduced, honourable to both parties: but the privileged Hindu class, no longer held in respect, and did not exercise the medical profession, which quickly sank into a state of empirical weakness. The independent and enlightened Hindu period ceased, and was succeeded by an ignorant and superstitious age of servitude.

Thus neglected by their Asiatic and European

conquerors, the Hindu science of medicine was still preserved in the sacred shastres. It was studied by a small privileged class of Brahmins, who sometimes taught its precepts to a few select youths,* and pretended that the laws of disease were to be discovered only by their superior knowledge. Ignorance engendered vanity, and led these practitioners to neglect that constant attention to the progress, nature, and treatment of disease, which is so apparent in the writings of the ancient authors, and so necessary for practice. They found it easier to invent than to describe, and a bold familiarity with a disease and its symptoms, was mistaken for a knowledge of its nature. This explains the general ignorance of the art of healing among modern Asiatics. The sick are so constantly imposed on by greedy and plausible quacks, that they generally reject the assistance of a physician, until the disease had advanced so far that little could be done by medicine. It is this want of confidence in their own practitioners which explains why European physicians, and even travellers in Asia, are assailed with prayers for medicines to prevent and to cure disease; as they are all supposed to be learned in the sciences, and

*"The only monopoly insisted upon by the Brahmins, was that of tuition. They allowed no other castes to teach." Wilson's Sanscrit language. Works, vol. v. p. 255.

to possess infallible means of acquiring wealth and curing diseases.

As Hindostan becomes settled under the British rule, and a richer and a more intelligent middle-class is forming, more attention will be paid to Hindu philosophy, and a more intimate knowledge of the ancient Hindu medical works will prove that they contain much that is interesting and instructive, and have been of extensive use to the medical practitioners of Asia, Africa, and Europe.

The education and the nature of the employment of the medical practitioner has a great influence in forming his character. Among the Hindus they have more learning and far less pride than any of the Brahmins, which proves the correctness of Sir William Jones' remarks that "the Voidyas are usually poets, grammarians, rhetoricians, and moralists; and may, in fact, be deemed the most virtuous and amiable of the Hindus." The physicians in Europe have been likewise commended for their talents and virtues, which may be accounted for by their liberal education, and peculiar duties. Pope said, "they are in general the most amiable companions, and the best friends, as well as the most learned men I know." "I believe," remarks Dr. S. Johnson, "every man has found in physi-

cians great liberality and dignity of sentiment, very prompt effusion of benevolence, and willingness to exert a lucrative art where there is no hope of lucre." And the Rev. Dr. Parr observes, "I have been long in the habit of reading on medical subjects, and the great advantage I have derived from this circumstance is, that I have found opportunities for conversation and friendship with a class of men whom, after a long and attentive survey of literary characters, I hold to be the most enlightened professional persons in the whole circle of human arts and sciences."

The cultivation of the mind improves the character of a people, and the difference is marked between the ancient and modern Hindu family of Aryan physicians, educated during many generations, and between them and the barber-surgeon of the Turanian race, without any education. As the subject is important, I selected an educated Voidya physician and a barber-surgeon, quite uneducated, from among my assistants, when in India, in order to examine the difference. The former, who was named Neen Chaund Doss Gupto, belonged to one of the four Voidya classes, which Bullal-Sen, the great Voidya king, had instituted. His family had been for many generations the chief physicians of the province he inhabited; and, in his authen-

ticated family history, it is stated, they have been from "time immemorial" distinguished as physicians. For fourteen generations particulars of each succeeding individual is given, which, allowing only twenty-three years for the length of each life, would carry back the history of the family to a period of more than three hundred years, or about the time of Telenga Mukund Deb, the last able and independent king of Orissa. After a brave resistance that monarch was conquered by the Mussulmans, and the distinguished men he had employed in his court were dispersed. It was at this time that Narayan Doss Gupto, (the physician or slave of Narayan, the Supreme Being), the first of this family of physicians, distinguished himself by his learning, and by writing a treatise on the manner of preserving health, the effects of the seasons, of climate, and of medicines derived from the vegetable, mineral, and animal kingdoms, in the cure of disease. His son was celebrated for his knowledge of medicine, and especially of the Ayur-veda. He, and seven of his successors, supported a gratuitous Sanscrit school, in which the medical shastres were taught. The third of these physicians, after distinguishing himself by his knowledge of the Vedas, left his home, and became a religious mendicant, as recommended by the shastres.

His son distinguished himself by the excellent medical school he conducted, and by the production of an able dramatic poem. The seventh was a poet laureate, and received a title of honour from the Rajah; as did his grandson, the eighth in descent. The tenth on the list wrote a treatise on the medicines required for the cure of different diseases. The thirteenth was physician to Rajah Roybullah, for more than thirty-five years; and in his old age he returned to his own house, in the Jessore district, on a pension, which he enjoyed for twelve years; dying in his seventieth year. His son, Neem Chaund Doss, was my friend, the fourteenth of this honourable list. From early youth, he had been intended for the medical profession, and was taught everything that was supposed necessary for succeeding in it. He studied the Sanscrit grammar, rhetoric, and poetry, before he commenced the study of the medical shastres; which engaged his attention for eleven years. In his thirtieth year he went to Dacca, the capital of eastern Bengal, in quest of employment, and in order to study the English system of medicine, of which he had heard so much. With this object he attended regularly the Dacca Dispensary and Hospital, and there he attracted my notice by his diligence and attention, and by his great intelli-

gence and industry. I procured a situation under Government for him, where he could witness European practice. His salary was small, but it was sufficient for his humble wants, and modest and retiring habits. He had an accurate and extensive knowledge of the medical shastres, a great part of which he knew by heart, and quickly distinguished himself in practice, by his activity and correctness, and by the judgment he displayed in the treatment of disease, and in the application of the Hindu medical precepts.

To mark the effect of the pursuit of learning, during so many generations, and the want of education upon the physical organisation of the Asiatic, induced me to sketch the profiles of the two medical men, with the dimensions of their heads. Fig. 1,

is the profile of Neem Chaund, and forms a striking contrast to fig. 2, the profile of a barber-surgeon,

who was born of low-caste parents, that had for generations received no education, and got their living by shaving, cleaning the ears, trimming the nails, inoculating for the small-pox, performing phlebotomy, extracting teeth, and assisting at certain pagan ceremonies, as that of fixing the hooks in the flesh of those who swung round on a pole at the Ratgatra. I had frequent opportunities of observing the character of this individual. He was ignorant and superstitious, but kind, affectionate, and methodical, with a good deal of cunning. Such a low branch of the healing art is not connected with any caste, rank, or religion. Still there are individuals among them who acquire much expertness in such a calling; and often make themselves very useful in their humble occupations. They seem to transmit a degree of manual expertness to their descendants, who sometimes distinguish themselves as lithotomists, oculists, &c.

If there be such a difference in the ranks of the medical profession, and in the organisation of the Hindu physician and barber-surgeon in the present adverse circumstances of the former, what must have been the inequality between the ancient and modern Voidya; as the former, the noble Aryan, descended from his primitive home into Hindostan, with his original conformation and mental energy,

and the advantages which a fine climate, leisure and independence afforded, for developing his active intellectual powers, of which we have so many worthy remains in the perfection to which he brought the Sanscrit language, the richness of his literature, his advanced knowledge of the sciences, particularly that of medicine; while the feeble Turanian yielded to his more intellectual master, and is still content with his modest lot, and humble calling.

The following history of the medical profession will include the social standing of practitioners, the progress of medical science, the biography of distinguished physicians in different ages and countries, the history of disease, and the origin and changes of medical institutions. The materials for this Review of the History of Medicine have been slowly collected as an amusement during the course of my studies, and during a long residence in Asia, where my occupation, inclination, and curiosity brought me into frequent contact with the native practitioners. When Secretary to the Committee of Public Instruction in Calcutta, I availed myself of the assistance of the most able pundits and mouluvies of the Bengal Presidency, in elucidating the ancient works of oriental medicine. I examined and translated what I considered the most

valuable part of numerous MSS., rejecting, in some instances, unimportant observations, and have retained others, though not quite correct, to explain peculiarities of thinking or acting; and in other cases the individual opinion of authors: my object being to convey a faithful delineation of the particular opinions and systems, and the exact condition of knowledge. To satisfy myself in particular points, I circulated queries to qualified individuals and friends, stationed in different countries; and my own opportunities, when in extensive native practice in the city of Dacca, enabled me to obtain information, and to arrive at conclusions as to its condition, towards the middle of the present century. The result may be more curious than important, but the detail of a truthful conclusion must always be of some interest and value.

My materials having accumulated so as to have become too voluminous for my original design. In 1845, I published a commentary on the ancient Hindu system of medicine.* Before that work appeared, an accomplished scholar had given an interesting account of Hindu opinions regarding certain diseases;† a persevering traveller

* Calcutta, 1845.

† Professor H. H. Wilson, Med. and Ph. Societies Transactions vol. i.; and Oriental Magazine for March, 1823.

had afforded a sketch of certain opinions contained in the Hindu medical shastres, as translated into the Tibetian language;* an antiquarian and a distinguished physician had published some of the peculiar opinions found in the medical works of the south of India;† and an able lecturer had combined all the information derived from these sources with important additions of his own;‡ but a comprehensive view of the Hindu system of medicine seems still to be required. In the present Review that system is compared with those of other nations, which have had an important influence in instructing and benefitting mankind; and separating the ancient from the modern and often more imperfect systems of medicine in Hindostan, and other countries.

The history of the medical sciences extends through so many ages, and is preserved in so many languages, that indulgence should be accorded to a writer on such an extensive and difficult subject. He must explain the most obscure opinions and systems, and must be prompt to detect, in the midst of error, the excellencies which belong to individuals and schools. Each of these

* Csoma de Kŏros Jour. As. So., Calcutta, No. 37, January, 1835.

† Dr. Heyne's Tracts in India; and Ainslie's Mat. Med. of India. London.

‡ Dr. Royle on the Antiquity of Hindu Med., 1838; Asiatic Researches, vol. iv., p. 159.

takes a different hue according to the character of the people among whom the profession is exercised, and the spirit of the age, so that historical as well as medical research is requisite, that he may give a just value to the influence which civilisation, and the doctrines of schools, have had upon the progress of the science.

The following Review of the History of Medicine will be considered under five periods, with reference to the sequence and resemblance of the different systems, rather than following a strictly chronological order.

1. The *primitive oriental period* was that in which the Aryan race, a sober reasoning people, employed their intellectual vigour and natural sagacity in the investigation of useful truths, developing their powers under a happy combination of circumstances. At that early period, the Hindu Brahmins arranged laws, regulated the calendar, promulgated distinguished scientific and literary efforts, and practised the healing art in all its branches. The mysteries of theology were combined with medicine and astrology, by this remarkable people, which was modified by sectarian Buddhists.

2. The second or western branch of the Aryan race form the *ancient period*, and will include the

Grecian and Roman systems of medicine, from the time of Thales and Pythagoras to the time of Sextus Empiricus, towards the end of the second century. During this period, there were stores of information accumulated by great men, which, combined, adorned and reflected by Grecian men of genius, conferred such glory on their country, and imperishable renown upon themselves: Lycurgus, Solon, Pythagoras, Plato, Herodotus, and Hippocrates derived the first principles of their investigations of mental and practical philosophy from an eastern origin. The duties of legislator, natural philosopher, religious teacher, and physician were combined in the same individual, or class of individuals, at this early age, and knowledge was strangely confounded and entangled. Greece became the seat of philosophy, and carried the sciences, including medicine, to a state of very considerable perfection. The Romans, so illustrious in arms and wisdom, were formed from the Etrurian, or Turanian, and Celtic races, which created the Roman civilisation and that of the south of Europe. The mixture of races, the climate, &c., modified the character of the inhabitants and the productions of the country. The Romans succeeded the Greeks, though they did not attain their intellectual greatness. They

were their scholars: they learned their language, and imitating the works of some of their sages, they formed a civilisation of their own. The study of ancient literature in Europe was interrupted, by the invasion of rude and hardy races from the north; who subverted the Roman empire, and destroyed what was most noble with relentless barbarism, preserving only what harmonised with their rude manners, or administered to their sensual pleasures. Persecuted by these ignorant masters, the learning of the West sought refuge in Egypt and the East, and Europe remained for ages in a state of lethargy.

3. The *transition period* will contain a sketch of the Egyptian and Jewish systems, and of the decay of learning in Europe. In this period, under the patronage of the Caliphs of Bagdad, medicine was cultivated with diligence, and with a certain measure of success both in Asia and Europe. This temporary greatness of the Mahommedan Arabs was not lasting, and their literary zeal, though energetic, was short lived. The translations and compilations which they prepared from eastern and western works of science, were for a time studied in the east as well as the west, but amidst the political revolutions and changes in Asia, they fell into a state of neglect.

4. In the *restorative*, or *copying period*, when learning began again to flourish in the congenial soil of Europe, medicine slowly revived. Security for life and possessions being obtained, convenience and enjoyment were the next objects of attention, and learning was found to constitute the highest gratification of the mind. The arts and sciences were first studied in the gloom of monasteries, but the Mahommedan schools in Spain, and other parts of Europe, were generally resorted to for studying the Arabian translations of the ancient classical authors, which would otherwise have been lost. Individuals and nations vied with each other in honouring the pursuit of learning, and the study of medicine exercised the genius of many great men, with much advantage to suffering humanity.

5. The fifth, or *philosophical period*, extends from the revival of literature and medicine in Europe in the fifteenth, to the beginning of the nineteenth century. In this more mature period of the history of medicine, the science was constructed on anatomy, observation, and reasoning, which led to a more correct classification and treatment of disease. Medical science being thus settled on its true basis, anatomy and physiology, advanced rapidly. New facts being a foundation for those

which are to follow, and not being confined to one state, or existing among one race, the advancement of the science resulted from the labours of able men in many lands. Though impeded at times by ignorance and prejudice, as learning advanced, the stream of knowledge flowed clearer, purer, and broader; the wisdom of to-day was eclipsed by the science of to-morrow. The more knowledge men acquire, the greater were the number of aspirants, and the more ardent their thirst for advancement in every branch of intellectual undertaking.

I have been more particular in my description of the ancient Hindu system of medicine, from its being, as we have seen, so little known in Europe, and as the prototype of so many other systems. During the progress of this part of the work, I had the assistance of several able pundits and moulivies; particularly the learned Abhaycharan Turkapanchanan, Superintendent of the Sanscrit and Bengalee department of the College of Muhammad Mohsem, Hooghly, who instructed me in the noble Sanscrit language, and with great perseverance and intelligence, assisted me in translating and comparing various medical MSS. I afterwards examined some of these translations with Madhusadan Gupta, Lecturer of anatomy to the medical

college, Calcutta, who possessed an accurate knowledge of the Susruta, which he had edited for the Asiatic Society of Calcutta. However, I found that his combined acquirements unfitted him for my purpose; as he, probably inadvertently, filled up the deficiencies of the eastern from the western systems of medicine, which I was so desirous of avoiding.

My friend, Dr. Beddoe, the distinguished physician of Clifton, Bristol, has been so kind as to correct a proof of the present work as it went through the press; and Professor Blyth, of Queen's College, Cork, kindly assisted me in determining the chemical components of the Hindu pharmaceutical preparations described in the Charaka and Susruta.

It has been my desire to record what I conceived to be important and curious in the most ancient records of medicine, pointing out the fabulous assertions, and giving the history of their physical and medical doctrines, so far as these appeared interesting. I trust that the publication may be of use in removing those errors which an imperfect knowledge of the medical records is so liable to engender among physicians, and which have operated most perniciously in retarding the advancement of medical science, while, at

the same time, it may assist in giving the proper degree of credit to the ancient Hindu philosophers.

The orthography and pronunciation of proper names will be sufficiently correct, if attention be paid to the following rules:—1. The consonants to be pronounced as in English. 2. The vowels generally as in the Italian language. The long vowels will be distinguished by the following marks:

à is to be sounded like a in tar
a ... ... ay in say
ê ... ... ee in see
o ... ... o in so
u ... ... u in too

When prolonged and general usage has given a particular pronunciation to a proper name, I have adopted it, unless there be strong reasons to offer for a change.

PART I.

REVIEW

OF THE HISTORY OF THE

PRIMITIVE PERIOD OF MEDICINE

AMONG

ASIATIC NATIONS.

THE student of history and the friend of humanity must feel a deep interest in the prospects of Asia, the first peopled, and the largest division of the Globe. This great continent contains 164,000,000 of the highest, or Caucasian, type of our race, the ruling caste of mankind, to whom Heaven revealed its mysteries; the first depositaries of its laws; the founders of social order; the apostles of all nations; the teachers of all generations; and from whom emanated all the civilising influences of the West. From Asia we derived the principles, the ideas, and the truths which are embodied in our creeds,

preached from our pulpits, and which pervade our laws and civilisation; and from her sprang the dynasties of the nations. The most distinguished of the ancient Asiatics, for their knowledge of the sciences and the arts, were the Hindu, Buddhist, and Chinese nations.

BOOK I.

REVIEW OF THE ANCIENT STATE OF MEDICINE AMONG THE HINDUS.

In examining the fountains of the East, from which Europe derived so much of its learning, no nation deserves a more careful consideration than the Hindus. Isolated in their position, and residing in a rich and fruitful country, they appear to have been satisfied with the knowledge and power which they had acquired at a very early period; and affectionately attached to their country, they retained for ages their own opinions and practices. Their systems of philosophy and medicine, like their religion, must be examined unfettered by Western prejudices. We must enter

into its consideration with an oriental largeness, as if we ourselves were children of the East. By so drawing near to them, we at once perceive, that above all other systems of medicine it is peculiarly the growth of their soil, their medicines the products of the Asiatic mart, and their speculations the product of Asiatic imagination, intellect, and prejudices. Asia can munificently give, but it does not need to borrow; its ideas and phantasies are as exuberant as its vegetation. There was an intellectual interchange among the different ancient nations of Asia, but the traces of this among the Hindus are very small, and the influence appeared to have been transient. This may be explained by Hindostan being surrounded by warlike Nomades, who extended their dominion, committing great devastations, and depriving the more peaceable inhabitants of their liberty, and obliging many of them to seek protection among the neighbouring rocks and barren mountains.

Their fertile country was thus repeatedly overrun by the Mahommedans, who persecuted and destroyed them with the most relentless cruelty, without making any impression on their religious belief, or diminishing the respect or veneration which they bore to their ancient modes of faith, and rules of action. Freed, for a time, from their

persecutors, their luxuriant country quickly resumed its former fruitfulness; and the intelligent and industrious inhabitants, under peaceful and sagacious princes, who promoted the happiness of their subjects rather than increased their own power by conquest, were soon restored to their former prosperity.

The permanence of the social and religious institutions of India, and its patriarchal customs, form, indeed, at the present time, a striking peculiarity. A maxim seemed to have ruled the whole conduct of the Hindu sages, which was to reserve speculative doctrines for conversation among themselves, while they taught the people such knowledge only as regarded the right use of life. Conquerors have repeatedly broken through the mighty barriers of Hindostan — superiority of civilisation have gradually accomplished the physical coercion of the Hindus by powerful nations of the West, who, in the prouder period of Indian history were rude and unlettered savages; and from the graphic delineations of ancient authors in the time of Alexander the Great, and the annals of the most inquisitive travellers, we arrive at an almost perfect knowledge of the customs, mythology, and peculiarities of thought which distinguished this primitive race: their

remarkable distinction of ranks, and separation of professions involved in the rules of caste; their festivals and solemnities; the rite of Suttee; the penance of the Fukeer; the charitable provision for Choudries and of public tanks; the peculiar tenure of land, and the modes of administering justice still exist, and have withstood the example of the alien, the persecutions of the Mahommedans, and the peaceful efforts of the Christian.

Still each caste exhibits its peculiar features, and every tribe has its distinctive stamp. Nurtured in a clime whose atmosphere imparts an energy to the soil which it denies to the inhabitants, where the earth spontaneously bestows that sustenance which elsewhere is the reward of industry and toil, where fuel and clothing are superfluous, and a hut, as grateful as a palace, is raised in a few hours. The natives of the plains are peaceful and effeminate, subtile, and ingenious; whilst the Hindus of the hilly tracts, invigorated by their mountain breeze, protected by their arid heights, are hardy and brave; and despising their feeble neighbours, and proud of their liberty, place their happiness in the battle and the chase. We thus explain the different phases, or local peculiarities of national character, manifested in different nations, and by the same rule, in different localities.

The national tendency of the mind is to run into grooves fashioned for it by customs and habits, until broken in upon and overthrown by great moral revolutions; sweeping away what is stagnant and decayed, or more frequently disfiguring what is great and good. This will be abundantly proved in examining the ancient, more perfect, and less known system of Hindu medicine; and the modern, and often more defective opinions of the profession. In considering the former, it will be necessary to give an account of the state of the profession; the origin, rank, and station of the physician; and his knowledge of anatomy, physiology, and therapeutics.

CHAPTER I.

STATE OF THE PROFESSION IN ANCIENT HINDOSTAN.

This division will contain an account of the history and medical works of the Hindus; the rank and duties of teachers; the character and duties of pupils, of the physician, attendants, and patients, and the recompense of the physician.

SECTION I.

ANCIENT HISTORY OF THE HINDU MEDICINE.

THE ancient history of the Hindus is divided into three epochs: — an age of freedom, of conquest, and of servitude. The first is the ancient Vedic, or independent period, which Max Müller divides into three periods. The first embraces the period when the Aryan race had recently settled in India, and extended from B. C. 1,200 and 1,000. The second, the Mantra period, from B.C. 1,000 and 800, when the Vedic hymns were stored up in the memory. The third, or Brahmanam period, extended from B.C. 800 and 600, when there was a gradual advancement of the priestly class, and the separation was made of the sacerdotal from the other classes. It was during this period that the four sacred Vedas are supposed to have been collected, viz.: — the Rik, Yajus, Saman, and Athervan. The Rig-veda is considered the most ancient, and consists of hymns, prayers, and mysteries in verse, which were repeated during the performance of religious ceremonies, when frequent libations of *Soma* wine were used, as required in the Brahmanam, or directions and explanations of the priests. These religious forms

consisted in theological utterances regarding the nature of God, of creation, existence, and fragments of history.

It was the second or Puranic age of the Hindus, or that of conquerors, when they were independent, that they distinguished themselves greatly by their manners, and their religion; and particularly by their great intellectual progress, when their scientific works were prepared, which does them so much honour. It was during this early period that the Hindus made such progress in the arts and sciences compared with that of other nations.

They possessed a fine climate, and rich soil, under a mild and just government, tempered with monarchial institutions, and regulated by enlightened sages.* Such philosophers distinguished themselves at an early period, in India, Persia, Chaldea, and Egypt, and afterwards as monks in Europe, where they exercised great influence in encouraging learning and virtue. These enlightened men in Asia checked that tendency to tyranny and oppression in their rich and powerful chiefs, and occupied their leisure in cultivating the arts and sciences, which they raised to a stage of perfection, that has rarely been surpassed. This explains the pride the Hindus claim for the first

* Magi, or the Wise Men of the East.

efforts of their genius, and their sages being employed in the service of the divinity, to whom they were allied in friendship, and from whom they were supposed to have derived their accurate knowledge.

They declared the universe will exist until the four ages (yugas) of the world expire. The first, the krita or Satyar-yuga, lasted 1,728,000 years, during which man was supposed to have remained prosperous, virtuous, and happy, and free from disease. It was during it, the four sacred vedas were prepared, containing all the knowledge supposed to be required by mankind. The second, or Dwaparra-yuga, lasted for 1,296,000 years, during which the third of mankind were reprobate, and disease appeared, life was curtailed, and memory impaired. The third, or Tritá-yuga, lasted 864,000 years, during which the half of mankind were depraved; and in the fourth, or present age, the *Kali*-yuga, which has lasted 432,000 years, the corruption of mankind has been such as to cause a still further curtailment of life, and embitter it with numerous diseases. Brahma took compassion on man's weak, degenerate, and suffering state, and produced the Upa-veda, or commentary on the sacred *vedas*. This second class of scriptural works of authority, consist of four trea-

tises. (1.) The *Dahrma-shastra*, the science of law, or the code of Manu: (2.) Dhaur-veda, the science of the bow, or military science: (3.) Gandharba-veda, the science of music, so named from the heavenly musicians of Gandharba: and (4) the Ayur-veda,* the science of life or medicine. This is intended to teach the proper manner of living in the world, by preventing and curing diseases in the present state of existence; and while the individual thus enjoyed health, he might perform the various purposes of this world, and thereby ensure his happiness and prosperity in another state. This sacred medical record of the Hindus resembles, in form and style of writing, the Athar-veda, or fourth sacred veda; and is supposed to describe the means of retaining health, the causes of disease, and the method of curing them. It also explains the qualities and effects of such articles as are useful to mankind. This remarkable work proves that medicine, at an early age in Asia, was connected with theology; and that the science of healing was supposed to be derived from the same source as their divine religion. This belief led them to consider it as part of their theology, and the same qualities were required in curing diseases as for other divine

* *Ayur*, period of living, and *ved*, to know.

purposes. It was exercised by physicians selected from among the Brahmins, the monopolists of the temporal and spiritual affairs of the ancient Hindus, who possessed the power of treating disease, and alleviating pain and suffering.

Among the ancient Hindus, so great was the importance of the knowledge of medicine that, besides being revealed by Brahma, the spirit of God, or creative spirit, it was exercised by Siva, the destroyer, or destroying spirit; Indra, the king of Heaven; Surya, the God of the sun; Dhanwantari, the prince of *Kasi*, or Benares, the great physician; the two Ashwins, or sons of Surya the sun, the physicians of the gods; and Dacsha, the prajapati, were all distinguished by their knowledge of medicine. No goddess is represented as interested in medicine, till a later period, when the dreaded Small-pox made its appearance, and committed great ravages in Hindostan; when a new form was given to Kalee, named Seetullah, wife of Siva, and named the goddess of Small-pox.

The systematic Hindu works on medicine, appear to have been compiled and arranged before the corruption of the mythological system. In some of the Shastris (such as in Charaka and Susruta) it is recorded, that the sacred Ayur-veda,

the most ancient system of medicine, and of the highest antiquity and authority among the Hindus, it is said consisted of one hundred sections of a thousand stanzas each, or a lack of verses (slokas). God, pitying the weakness and suffering of mankind, and the impossibility of their learning so large a work, abridged it, and divided it into six parts, viz:—

1. Sutra-st'hana—surgical definitions.
2. Nedana-st'hana—symptoms or diagnosis.
3. Sarira-st'hana—anatomy.
4. Chikita-st'hana—therapia.
5. Kalpa-st'hana—or doctrine of antidotes.
6. Uttara-st'hana—or supplementary section on local diseases.

Fragments only of the Ayur-veda have escaped the destructive ravages of time, and are found in the works of commentators; and as all their medical information was supposed to have been derived from the full and true account of every branch of the healing art, we are enabled, through their works, to judge of the arrangement of the original. Its general plan is given in Susruta, in which medicine is divided into eight sections. These are:

1. *Salya*, or Surgery; including the mode of removing external substances, accidentally

introduced into the body—as grass, wood, stones, iron, earth, bones, hair, and nails, with pus which had not been evacuated. It explained the means of removing the dead child from its mother, of healing wounds inflicted by sharp instruments, as a knife; of applying bandages, using surgical instruments in operations, of applying escharotics and fire, and of the treatment of different kinds of inflammation, abscesses, and other surgical diseases.

2. *Salakya* includes the description and the treatment of external and organic diseases of the eyes, ears, mouth, nose, and other diseases situated above the clavicles. These two constitute the surgery of modern schools.
3. *Kaya Chikitsá*, in which are described the diseases which affect the whole body—as fevers, consumption, (soshá) mania, (unmada,) epilepsy, (apasnara,) leprosy, (kusta,) diabetes, (bamutra,) and other diseases of the same kind.

This may be considered as constituting the practice of physic.

4. *Bhutavidya*, or the means of restoring the deranged faculties of the mind, supposed to be produced by demonical possessions; as by

the anger of the gods, (Devtas,) devils, (Asurs,) or another kind of devils, (Gandarba,) demigods or devils, (Jaksha,) giants resembling devils, (Rakshas,) spirits of dead men, (Petrigriha,) and other kinds of devils, (Pishacha.)

These various demigods, when enraged, were supposed to enter into the person, and produce the various diseases of the mind; which could only be removed by prayers, medicines, ablutions, and offerings to the offended deity.

5. *Kaumara-bhritya* comprised the treatment of infants, the effects of bad milk and improper diet; the nature of infant diseases, including those produced by the displeasure of certain demigods, (Graha).* In this division, also, was included the treatment of wet-nurses, when their milk was bad.

6. *Agada.* — In this division the administration of antidotes for poisons was considered; as for preventing the effects of, and diseases produced by mineral, vegetable, and animal poisons, such as the bites of dangerous serpents, insects, &c.

7. *Rasayana* treated of those medicines which

* Many of the diseases of children are still supposed to be produced by the entrance of devils into the child's body; which are expelled by particular prayers offered up to *Panchanana*, (Siva.)

cure diseases in general, and restore youth, beauty, and happiness. This division embraced chemistry, or more properly alchemy, as the chief of the chemical combinations described in it are metallurgic, and the intention was to discover the universal medicine—the panacea that would render health permanent, and life perpetual. Such a medicine was supposed to preserve the energies of youth, strengthen memory, lengthen life, and prevent as well as cure disease.

8. *Bajikarana.*—This division made known the best means of increasing the human race, by pointing out the mode by which tone was given to the weakened organs of generation, when the sensibility of these parts became diminished or deranged.

These remarks upon the divisions of this most ancient work, are the only parts which have come down to us. They afford the most incontestable evidence of the Hindu medical writings having been the result of observation and experience; and the authors assigned a divine origin to them, in order to increase the respect paid to the books, and to themselves. They thus seem to have arranged the diseases according to the frequency

of the assistance required from the art, and in the order in which the knowledge of medicine naturally advanced.

The sacred Ayur-veda thus contained a description of the structure of the human body; an account of the causes and diseases to which it is subject, reduced to a systematic form; the enumeration of many useful remedies; and the precepts for preserving health, and curing diseases.

In some of the Shastres (Charaka, Susruta), it is stated that Brahma first instructed *Dacsha*, the *Prajapati*, the father of *Durga*, in the *Ayur-veda*, as he was an ocean of wisdom. He wrote a book named the *Chikitsa-Darshana*, and by him it was communicated to the two *Ashwins*, or offspring of the sun *(Surja)*. Others say that Brahma gave the Ayur-veda to Surja, who, like the Phœbus or Apollo of the Greeks, was supposed to be the fountain of medical knowledge among the Hindus. The Ashwins became the medical attendants of the gods, wrote works on medicine, named *Chikitsa-ratnatantra*, and the *Bhramaghagya*. As the gods enjoyed eternal youth and health, they stood in no need of a physician's care; but in the wars between the gods and demons, they were useful in curing wounds and other chirurgical accidents, and by their remarkable skill, the Ashwins

became very celebrated. When the fifth head of Brahma was cut off by Rudra, it was joined again by them, "so great was their knowledge of surgery." They also cured immediately the wounds in the battle between the gods *(devtas)* and giants *(asura)*. Indra had another opportunity of judging of their knowledge of medicine by their curing his paralytic arm, became desirous of examining the Ayur-veda, and was taught by the Ashwins.

Sometime after this, mankind, in consequence of their wickedness, became divided into sects, ignorant, restless, unhappy, and afflicted with numerous painful, and dangerous diseases; and as health is the origin of desire, virtue, holiness, riches, and external happiness; so disease diminishes strength, energy, faith, knowledge, holiness, and length of life. It also weakens the senses, and defiles and destroys the soul.

The sacred sages (Munis) were grieved at a spectacle so melancholy, and, in order to search for a remedy, Bharadwaja and Atreya, with numerous sages, met in the Himalaya mountains. According to Charaka, their names were—Angira, Jamadagni, Vasishto, Kasyapo, Bhrigu, Atreya, Gantama, Sánkhya, Pulastya, Nárada, Osita, Agasta, Bamadeva, Markandeya, Aswanáyan, Parikshita,

Bhikshuratreya, Bharadwaja, Kapinjala, Viswamitra, Aswaranya, Bhargaba, Chayabana, Obhijit, Gargya, Sandilya, Kaundilya, Abarkshi, Devala, Galavo, Sankritya, Vaijavapaya, Kusika, Vadarayana, Barisa, Saraloma, Kapya, Katyayana, Kankhayana, Kaikasaey, Dhauma, Marichi, Casyapo, Sarkarakshyo, Hiranyakshyo, Lokakshya, Paingi, Saunaka, Sakuneya, Mailreyao, Gautamayani, and others.*

These holy sages were distressed at the sight of the weakness and sufferings of mankind, which had increased to such a degree, that they saw "with the eyes of their understandings," that the only method of removing such calamities was by the assistance of the deity; and they resolved to send one of their number to the thousand-eyed Indra in heaven, to make known to him the condition of mankind, and to acquire a knowledge of medicine: Bharadwaja was selected. He went, and beheld Indra, resplendent like fire, and, by the following prayer, propitiated his favour: "Oh! King of the Gods! created for the salvation of mankind, I have been sent by the sages of the Earth to ask your assistance. Take pity on the weakness and infirmities of man, and teach us the *Ayur-veda.*"

* I give these names, as their meaning is generally unknown: proving the Charaka to have existed before the Hindu Pantheon was instituted; from which afterwards proper names were derived.

Indra was pleased to grant the prayer of the petitioner, and enlightened him in the precepts of the science of medicine; as from his knowledge, such alone were required to be imparted. These embraced an enumeration of the causes, symptoms, and properties of medicines, for those in health as well as in sickness.

With the knowledge of the Ayur-veda, the sage returned, and related to the Rishis the precepts which he had thus acquired. These consisted of—

1. General character of everything (Sámana).
2. Classification (Visesa).
3. Elements (Drabya).
4. Qualities (Guna).
5. Actions (Karma): and
6. Combinations (Sanjoga).

By means of such knowledge, the Rishis remained healthy and happy. Among these, Atreya, who had been instructed by Indra, imparted to his numerous pupils the knowledge which he had thus acquired for the good of mankind

SECTION II.

RANK AND CHARACTER OF HINDU SAGES.

These pupils of Atreya, or Brahmins, were considered as forming the first in social rank, the emblem of wisdom; who, according to their mythological fancy, proceeded from Brahma's mouth—the first person, or creative power, of the deity. They filled the most eminent rank, whose duty it was to perform the rites of religion, and to instruct mankind in the path of learning and duty. It was this superiority of intellect that caused the Brahmins to be considered as *Diers*,* or magicians, by their more ignorant neighbours. The Brahmins were always jealous of any encroachment on the interests of their order; and their influence was useful in encouraging learning, and improving the morals of their countrymen; but caste became pernicious, when it became permanent, retarding progress, and an instrument of the passions.

At an early age, the Brahmin was set apart for the acquisition of learning, and with a knowledge of the world, and the wants of their

* The enemies of Persia are termed *Diers*, from *Dier*, which means a Brahmin in the Sanscrit language.—*Malcolm's History of Persia.*

countrymen, they soon distinguished themselves by their acquisition of the useful arts and sciences, which was ascribed by their ignorant countrymen to a supposed friendship with the deity. The appointment, and even the selection, of their king, was at one time entrusted to the Brahmins who ruled the councils of the state. He was chosen from the second, or *Khetrya* caste, or class of the profession of arms; as it was felt of importance to be able to defend themselves from their rapacious and warlike neighbours. The members of this class reigned over the country, and filled the executive offices of the state, while they retained an inferior social rank to their spiritual advisers. As the emblem of strength they were supposed to have sprung from the arms of the deity, and were destined to govern, and defend the people. These rulers of the state employed every means to retain the good opinion of their spiritual guides; which explains the extent and magnificence of their religious establishments in Hindostan.

The Brahmin was the physician; but the important manual department of the profession could not be properly exercised by the pure Brahmin; and to meet this difficulty, at an early period, another caste was formed, from the offspring of a Brahmin with a daughter of a Vaishya. To

give the arrangement more importance, it is stated that Ambá, a menial of the Muni Galaba, afforded him so much satisfaction, that he blessed her, and informed her that she should have a boy, whose name should be *Virabhadra* (most fortunate), and that his profession should be that of medicine. The child was called Ambasta, or more commonly Vaidya, as stated in Manu, and his offspring formed the Vaidya caste, who understood the Ayur-veda, or Medical Shastre. This caste claimed a respect only inferior to that afforded the Brahmins of the first order. They had access to all the Shastres, and became learned pundits and skilful physicians. The Brahmin learned the medical Shastres for his own interest and character; the Khetrya, for the benefit of his health; and the Vaidya, for his subsistence, as he was alone allowed to receive recompense from the sick.

In a more modern age, other persons, even of the degraded Sudra caste, were allowed to be taught the Ayur-veda; when honest, learned, and of respectable descent.

In such a state of society, the chiefs and Brahmins were everything, and the people nothing. By the same arrangement, these were divided into the third class, or *Vaishya*, who was supposed to have been derived from Brahma's navel, to cultivate

the land, to traffic, and to provide man in the social state with the necessaries of life; while the *Sudra*, or fourth class, derived from Brahma's feet, as the emblem of subjection, was intended to labour, to serve, and to travel. Those who were content with their condition, were stated to be the persons who most readily obtained perfection.

The priestly office, like that of the druids and monks of Europe, was the road to distinction, and was guarded by caste in India. Within its sacred precincts learned men began to investigate truth, promote learning, encourage peace, and other social qualities; teaching the nation how much happiness and comfort might be derived from the rich resources of nature.

In Europe, the first rank in society was the prize of the warrior, for, too often, his success in violence and rapine; and it was continually changing, and readjusting; whereas, in Hindostan, rank and station were permanent, and were supposed to be reached by the successful cultivation of the mind, and the practice of virtue. This was not the case in practice, and however noble qualities an individual of the inferior caste in Asia possessed, his rank was fixed, and however distinguished, he was still degraded, and his duty that of servitude; whereas, the Brahmin might be ignorant,

wanting in self-respect, patience, rectitude, wisdom, and learning, and was still respected: the real character thus forming a contrast to the hereditary, which brought the system of caste into disrepute; as a character was assumed, and acknowledged, which was not deserved. This retarded learning and civilisation, which can only be fostered by the love of liberty, and the sovereignty of public opinion.

It would thus appear that the institution of caste first accelerated the advancement of knowledge, by accumulating the experience of generations, enabling them to acquire a degree of hereditary aptitude and manual expertness, and develope an extent of ingenuity, that has scarcely been equalled in Europe. The Sanscrit language was taught to the Brahmins; and the *Khetryas* and the *Vaishya* were formerly included among the twin-born, and were privileged to study the Sanscrit language, and read the sacred vedas, like the Brahmins. The Sudra was not interdicted from learning the Sanscrit, although not allowed to read certain books of essential importance to the study of the language. The same obstacles still exist in theory, but from the diminished influence of the Brahmins, these obstacles may be considered as in reality removed. Every caste is now allowed

to learn the sacred language. They only observe that Brahmins do not submit to learn Sanscrit from the Sudras, or from impure and degraded Brahmins.

SECTION III.

EDUCATION OF THE HINDU PHYSICIANS.

The education of the upper classes among the ancient Hindus was pursued with care, and was peculiar, to suit the manners of the country. The school was generally held under a spreading sacred tree, at some distance from the town or village to which they belonged, where the professor, or *guru*, delivered his lectures. These consisted chiefly in explanations of the principles of science, which were varied according to the particular branch to which the student was chiefly to direct his attention. One guru was celebrated for theology, another for science, a third medicine, &c. Before admission to such tuition, the youth required to know certain studies, to be of sufficient rank and capacity, and to have afforded satisfaction to his instructor. Such a youth was allowed to

enter upon his studies, and was taught in the learning of the sect.

The lectures consisted chiefly in inculcating orally the principles of natural religion, and describing the perfection of the Supreme Being, the wisdom and goodness of providence, the admirable harmony of the universe, the position of man in the scale of beings; the end of his creation, the dignity of his nature, and the means of exalting it to the highest degree of perfection.* They explained the immortality of the soul, and the duties of man to his neighbour, and to his creator; and the advantages that arose from attention to morality. The teachers took pains to show that a life of hardship, in which a man was continually exposed to what the world thought the greatest evils, such as abstinence from food and drink, residing in solitude, and bearing the inclemency of the seasons, was preferable to any other course, as it led to the possession of true wisdom, the obtaining a perfect command over the passions, and the enjoyment of health, with undisturbed peace of mind.

It was not alone to precepts of philosophy, that the guru attended, but they guarded the pupil against the commission of dangerous errors and

* Apuleius in Florides, lib. 2. Clem. Alexand. Stromat. lib. 3.

gross vices; as they considered themselves to be employed in the service of the deity, who aided them by his friendship in the execution of their great work, and in the investigation of the weakness of nature. The students were obliged to attend several hours a-day, to the instruction of their guru, and to meditate in solitude on the truths of philosophy; and they amused themselves with experiments, and the conversation of their friends.* They had before them the example of rigid virtue in their preceptors, and were exposed to their reproaches if they were not, at any time, equally firm in their principles and practice. They had the pride of sustaining the rank of their Brahminical caste, the first in the state, to which the highest honours were awarded, which encouraged them in the pursuit of studies which were attended with so high a reward.

When he had completed his novitiate, the student was allowed to devote himself entirely to religion, so as to ensure final beatitude; † or to marry a woman of his own caste, and then search for the means of support. This may be by lawful gleaning and gathering, and receiving what is given him unasked. Should these means

* In Strabo, lib. xv. Arrian in Indius Apuleins.

† Manu, ch. ii, verses 243, 244, and 249. Ibid, ch. iii. v. 2, 4.

fail, he may ask for alms, become a soldier, or resort to tillage, or the care of cattle—the latter being preferred to the former.† When greatly distressed, he may engage in traffic, but service for hire is pronounced "dog living," and must be avoided.‡ When the Brahmin has seen the child of his child, he should retire to a forest, and devote himself entirely to holy studies, to contemplation, the practice of sacred rites, and the endurance of severe mortification;§ and a still higher degree of purity is when the Brahmin abandons all sensual affections, and reposes wholly in the supreme spirit.‖

The life of the Brahmin was thus pure and simple, and those pleasures which seduce the rest of mankind had no charms for them. Their apostolic equality rendered them independent, and banished envy, jealousy, ambition, and malice. They looked upon each other as brethren, whom nature had made equal, and as children of a supreme God and Father, who sought to share alike the inheritance he had given them. Reason was the sole guide to the execution of their desires.

They believed that all countries produced whatever was requisite for making them happy;

* Manu, Chap. x. verse 81. † Chap. x. v. 82 and 83.
‡ Chap. iv. verse 6. § Chap. vi. verses 1 to 10.
‖ Id, ch. vi. verse 33.

and that reasonable men ought rather to contract their appetites, and be content with what nature bestows, than augment the inconveniences to which human nature is subject, by desiring the products of other lands. Man ought to be satisfied with the state he was in, and never so much as murmur at the accidents that befel him. On this account they were exempt, in a great degree, from disease, which was known to them by the complaints of others; and that pure joy, which reigned in their breasts, was only disturbed by the miseries of other people.

They loved all sorts of labour which exercised the body, and procured the necessaries of life; while they punished idleness, held nothing that constituted property, and detested gain—as it created a thousand wants in the heart of man, and rendered him poorer in proportion as his wealth increased. For a like reason, they dreaded pleasure as the source of weakness. With such opinions, the bird was allowed to fly undisturbed in the air, the beasts fed peaceably in the fields, and the fish were unmolested in the waters. They possessed all they could wish, because they desired no more than they wanted.

They avoided unnecessary dress, as it had the appearance of softness and luxury, and even the

women were persuaded that fine and gaudy attire was rather troublesome than ornamental, and that art cannot add to beauty, or supply the want of it. Their independence delivered them from fear and subjection. They warmed themselves in the sunbeams, the dews refreshed them, and they neither dreaded wind, rain, cold, nor heat. They washed themselves in the river, and lived on the roots and herbs the fields produced; and thus indifferent to their food, they knew not what delicacies were. They neither levelled forests nor rocks to build their houses; being content with huts or caves for their habitations during life, which served for their sepulchres after death. The earth served them for a bed, and care never disturbed their sleep. Peace of mind preserved their thoughts free and independent, delivered them from fear, and from subjection of every kind. It was by mildness and reason, not by force, they maintained a good understanding with their neighbours. They knew not how to handle arms, and as they never provoked strangers, the idea of killing a human being filled them with horror. "Fortune alone is our enemy, and generally the blows which she aims, fall beside us; attentive as we are to do nothing that may expose us to mischief, we have few evils of which we can justly complain.

Death only troubles us when we are taken off suddenly: otherwise the father attended not the funeral of the son; as he considered it as the lot of nature, which is our constant guide."

It is impossible to set a limit to the advancement in science of those ancient philosophers. Trained from an early age to observe, to think, and to reason: their minds were kept actively engaged, their heads kept clear, and their breasts full of confidence, the result of innocence. They considered themselves, and were considered by others, as a superior race of mankind. This led them to a correctness of behaviour, and a degree of pride which prevented them visiting any one; and when visited, they entertained them with moral and philosophical discourse suited to the capacity of their hearers. They meddled little with the common concerns of life; despising the pleasures which other men sought, and the difficulties of which they complained. It was by the strict discharge of their public and private duties, and by the austerities of their lives, that they maintained their influence over the people, and supported that dignity and precedence which the laws had given them. It was these men who, instead of propitiating Alexander the Great, by persuading their countrymen to submit to him,

exerted their eloquence, and all their influence in inciting their countrymen to behave with courage and firmness in defence of their liberties, which exposed them to his resentment. "I told him," (Alexander) said a Brahmin, "he ought either to live free, or to die in the endeavour to live so; and that man should only desire life till death shall become more eligible." * Another Brahmin declared, "If he should put me to death he will only release my soul from this old decrepid body, which will then pass into a freer and purer state, so that I shall suffer nothing by the change." †

The same enthusiastic votary may still be found among the Brahmins of India of the present day, combining great learning with the most simple and virtuous life; while a large proportion have no such pretensions, but follow secular pursuits of all kinds, and are by no means scrupulous as to the manner in which they gain their end.

SECTION IV.

ANCIENT HINDU MEDICAL AUTHORS, AND ANALYSIS OF THEIR WORKS.

THERE is an absence of dates in the ancient chronicles and history of India; and as science

* Plutarch in Alexandro: Clem. Alexr. Strom. lib. vi., page 457.
† Strabo, lib. xv.

has proved the fabulous character of their chronology, we have little to guide us as to the age of their systems of medicine, while the philosophical and religious speculations of the Hindus are often well defined. The sacred hymns, composing the Vedas, were probably prepared during the vedic period, which commenced about B.C. 1400, while their Upa-vedas, or treatises in general literature, are not traced higher than B.C. 900, when the laws of Manu, &c., were compiled.

The Ayur-veda is allowed to be the most ancient system of medicine, and is of the highest authority; but the age in which it was written is not known, and fragments only of the MS. are now procurable. It is said to have been prepared by Bramha in the Satyar-yuga; or, perhaps more correctly, as we have seen, about the period of the Manu code of laws. From the terseness of the descriptions of disease, there was considerable difficulty in understanding them, and many commentaries have been written on the subject.

The nature of medicines and diseases is treated of in some of the Purans, particularly in the *Vignì-Purán*. These works are said to have been prepared by *Devtas* and *Rishis*, and some of them are still procurable.

We find the names of the following authors in the great epic poem, Mahábhárata; * they are said to have flourished under Yudisthira, in the beginning of the Kali-yuga.

AUTHOR'S NAME.	NAME OF THE WORK.	
	Found.	Supposed to be Irrecoverable.
Atrya	Atri Sangitá ..	
Agnibesa ... Charaka	Charaka	
Bhíla	.....	Bhíla Tantra.
Jatukarna	.....	Jatukarna Tantra.
Parásara	.....	Parásara Sangitá.
Hárita	Hárita Sangitá	
Kárparí	.....	Kárparí Tantra.
Dhanwantaree Susruta	Susruta	

These works are supposed to have been compiled by different sages, on the plan of the original

* Written, according to Bentley, A.D. 600.

Ayur-veda; and it is an interesting circumstance, that the anatomical parts appear to have been prepared from actual dissection.

The uncertainty of dates extends to these two ancient commentators; and some difference of opinion exists as to the respective ages of the Charaka and Susruta. A very general belief has prevailed in the East, and among oriental scholars, such as the late able and distinguished physician, Professor H. H. Wilson, that the Charaka is the most ancient existing medical work; and the itinerant life, and oral instructions delivered, without any previously arranged plan, and recorded by the pupils, indicate a more ancient age than the more systematic work of Susruta. Indeed, in variety and copiousness, the Charaka may be compared to the works of Hippocrates, who, most probably, derived many of his observations from this source. Both of these Hindu systematic authors exhibit great knowledge of the profession, and great judgment and discrimination in the treatment of disease.

To afford a general, and clearer view of the Hindu system of ancient medicine, a short analysis of the two great systematic medical works, and their ideas on cosmogony, will illustrate the principles upon which their theoretical reasoning is based,

and explain many of the views of the modern Asiatics, which would be otherwise obscure and unintelligible.

Charaka and *Susruta* are supposed to be commentaries on the *Ayur-Veda*, being more suited to the understanding of a degenerate and suffering people; but, the Hindus did not allow the prejudices that now exist in Asia, against touching the dead body, to interfere with that important and necessary branch of knowledge, which can be acquired by dissection alone. Both these medical works, in a more modern mythological sense, were supposed to be derived from God, to avert disease, the result of the sins of mankind; Charaka, having been prepared by a Munee (*Atrya*), who was instructed by Indra; while the Susruta was believed to have been imparted by the venerable Dhanwantaree to his disciple Susruta.

The faculties of these sages were said to be developed, to enable them to understand the *Ayur-veda*, and to distinguish the peculiarities of disease, and the qualities of medicines. Thus enlightened, they gained much distinction by the cures they performed, and enjoyed vigorous health to a very old age. These sages prepared works called by their own names, which were read before the assembled sages, and gave such satisfaction,

that, "with a voice which reached to heaven," they proclaimed their admiration of the authors. Agnibesa was declared to have produced the best practical work; and after it was corrected by Charaka, it received his name,* and he became the instructor of practitioners on earth, as the Prajapate were in heaven.

Charaka is considered the most ancient, and the most celebrated Hindu medical work extant. It is arranged in the form of dialogues, or lectures, between *Atrya* the master, and his pupils, in their conferences. They follow the eight divisions of the *Ayur-veda;* and, from the manner in which the instruction is conveyed, the conversation is often desultory. The subjects discussed seem naturally to suggest themselves at these conferences between the master and his pupils. A systematic work is not attempted; but rather the most practical and important subjects are discussed for the supposed benefit of mankind. This explains the variety of subjects that are treated in the same book.

The first book *(Shloka-s'thana)* explains the origin of medicine, and the duty of the physician; the arrangement, property, and use of medicine;

* Which, in the Sanscrit language, means, one who makes journies, or excursions.

the cause, nature, prevention, and cure of disease. These subjects are considered in thirty heads, not always well defined. The following are the twenty chief sections: origin of medicine; materia medica; use of medicine; diet; causes of disease, and means of preventing them; the duties of the physician to the patient and attendants; hot steam baths; preparation of medicine; derangements of the head and belly, and other diseases; regimen; nature of the diseases of the blood; the advantage of treating disease; the classification of food into solid and liquid; the enumeration of the ten vital parts; the necessity of a skilful physician for the cure of disease; the means of retaining good health; and the knowledge of disease.

The second book contains a description of diseases *(Nidana-s'thana)*, as fever, and its causes; discharges of blood from the natural orifices; tumours (gulma); diabetes, and gonorrhœa; leprosy; consumption; mania and epilepsy.

The third book *(Bimana-s'thana)* considers the causes and nature of epidemics; the nature of food; the symptoms, diagnosis, and complications of disease; the use and variety of medicines; and the peculiarities of the fluids of the body.

The fourth book *(Shariza-s'thana)* contains remarks on the nature of the soul; conception; the

varieties of the species; the qualities of the elements and their combinations; a description of the different parts of the body; and the connection of the soul and body.

The fifth book *(Indriya-s'thana)* contains a description of the organs of sense, and their peculiarities and diseases; the colour of the body, and the medicines to improve it; general defects of speech; diseases of the body, and those symptoms which affect the senses, and other parts of the body; the causes of the diseases of organs, and of other parts; sudden loss of strength; death.

The sixth book *(Cheketsa-s'thana)* considers the treatment of disease, and the means of improving the colour of the body, increasing vigour, and enjoying long life. This is accomplished by improving delicate health, increasing strength, avoiding disease, and so reaching old age. By feeding cows you improve the colour of the body, and increase strength by the use of their milk. The treatment of different classes of diseases, as fever, dropsy, swelling, piles, chronic diarrhœa, jaundice, asthma, cough, dysentery, vomiting, erysipelas, thirst, and the effects of poisons. Remedying the consequences of drinking intoxicating liquors, of local and general inflammation, of diseases of the vital parts, of large

abscesses of the thigh, of rheumatism, and of spasmodic and paralytic diseases.

The seventh book *(Kalpa-s'thana)* treats of emetics and purgatives, and the manner of using antidotes, and medical charms. This book is divided into twelve chapters, in which is given the manner of exhibiting the emetics and purgatives used by the ancient Hindus, with directions for employing them: and

The eighth book *(Siddhi-s'thana)* treats of injections and evacuating medicines, and describes the vital parts of the body. This book is divided into twelve chapters, of which the chief subjects are, the evacuating medicines used in fever, injections for the urethra, vagina, and rectum; abscesses, their results and treatment; the use of clysters for the cure of diseases; a description of vital parts, &c.

The following are examples of the questions asked by the pupil, *Agnibesa*, and answered by *Atrya*, the teacher, which may be offered as an example of the manner in which a philosophical subject is treated in one of the chapters of Charaka. The pupil asks, "What is the soul?" "How is it produced?" "What is the cause of the formation of the body?" "Is the soul ignorant or wise?" "Is it eternal or destructible?" "What are the temperaments?" "What

is disease?" "What are the proofs of the existence of the soul?" "Why do some philosophers say that the soul is inert, independent, that it represses the passions, is omnipresent and omnipotent?" "Why do they say the soul is an emanation of the deity?" "Why is it called the witness of the actions of the body?" "If inert, why do we see its actions?" "If independent, why does it enter the body?" "If a represser of the passions, why is it always desirous of indulging the passions, and grieving over our misfortunes?" "If the soul is omnipresent, why does it not feel the pains of others; and if omniscient, why do we not see it in mountains, hills, and other situations?" "Does the soul exist before or after the formation of the body?" "If the soul is the conscience or witness, has it any judge?" "How does it support the pains of disease?" "Do practitioners employ means to prevent disease, and when present, what is the treatment?" "What is the cause of pain in disease, and where is it situated?" "How many kinds of pain are there; and how are they removed?"

The work of Charaka is of the highest rank; but from the author's want of exact anatomical and pathological knowledge, his manner of treating

the subject, and his arrangement and description of disease, are often obscure, although they may be generally accurate. In this work, simple medicines are employed, often in combination. These ingredients were increased in number, and became extravagant in the varied combinations employed in the therapeutical department of more modern works.

To increase the importance of these great medical systems, a fanciful mythological origin is given to them. That of the second, or Susruta, is thus related: when the Vedas were lost in the deluge they were recovered by the great serpent *Ananta*,* upon the thousand heads of which the world rests. At the churning of the ocean by the gods and demons, in searching for the waters of immortality, the ocean was converted into milk, and then into butter, from which precious gifts (*ratnas*) were derived. Among these was Dhanwantaree, the physician, or holy sage, the possessor of the water of life (*Amrita*†) drunk by the immortals. He is represented as a venerable old man, with a book in his hand.‡

Dhanwantaree was instructed in the Ayur-veda

* A *devta*, also *Vishnu*; which signifies the end, endless, eternal, boundless.

† *Amrita*, that which gives life.

‡ This Esculapius of the Hindus has no attendant serpent like his brother in Greece.

by Indra, and practised medicine with great success in heaven, and became celebrated there: but, witnessing the ignorance and misery of mankind, and the frequency and fatality of the diseases which afflicted them, he descended upon earth to instruct them in the means of preventing, as well as of curing diseases. He flourished in the mythological age, is mentioned in the most ancient Sanscrit writings that have been preserved, became king of *Kasi*, or Benares, and acquired much celebrity by the cures which he performed. The divine sages, aware of his great knowledge, and witnessing the misery of mankind in consequence of their ignorance, resolved to petition Dhanwantaree to assist them.

With this intention, *Oupudhnuba*, *Baiturana*, *Aurabhra*, *Poushkalabata*, *Karabirja*, *Goupuraa*, *Rukeeta*, *Susruta*, were selected to visit *Devadasa*, or *Dhanwantaree*, formerly the practitioner of heaven. On their arrival at Benares, they found that he had retired to the jungles. They followed him to his retirement, and as they approached him, after mutual salutations, they delivered the following address: — "Deign, Sovereign Ruler, to bestow upon us the power of preventing and curing the many diseases

under which mankind is suffering—affecting their bodies, tormenting their minds; and which, with the numerous accidental and natural diseases, distress them so much that they seem to be without friends. Their destitution grieves us much, and we pray that you will instruct us in the cause, the nature, and the cure of disease; the means for retaining health, and for promoting the welfare of the soul in another world. Like scholars, we come to receive this information from you." Dhanwantaree answered, "Your wishes shall be granted." The sages then informed their preceptor, that as they were all of the same sect, one of them should ask the questions, and write down the answers required, and the others see that they were correct.

Susruta, son of *Viswamitra*, an ancient Hindu hero, as attested by very old Hindu MSS., particularly the Rig-veda, a contemporary of Rama, was chosen to be the person to be instructed in medicine. Dhanwantaree said that Ayur-veda was for the cure of disease, and for the preservation of health; but it was too voluminous to be recollected by the present degenerate race of mankind. He recommended Susruta to abridge it, and to arrange it into parts, so as to be easily understood by his pupils, who studied it with attention. This work

is still preserved, and after Charaka, is the oldest book in medicine which the Hindus possess, and is of highest authority. The following is the manner in which it was supposed to be prepared:—

Dhanwantaree asked his pupils, on what shall I first lecture? They answered, on Surgery; because formerly there were no diseases among the gods, and wounds inflicted in the battles between the gods and demons were the first injuries which required treatment. Besides, the practice of surgery is more respected, as affording immediate relief, and is connected with the practice of medicine; although the latter has less connexion with surgery.

The eight divisions of the Ayur-veda, are arranged in the following six books, by Susruta:—

1st.—Medical doctrine, (*Sutra-st'hana.*) This book treats of miscellaneous introductory subjects, such as the principles of medicine; the origin of medicine; the selection, management, and inauguration of pupils; their faculties; the first principles and elements of the body; and various forms of disease and accidents, and their treatment. The rules for teaching; the duty of practitioners; the selection and use of instruments, and of medicines; the influence of the weather on health, and the practice to be followed after surgical operations.

Then follows the description of the diseases of the humours, and of surgical diseases; the restoration of defective ears and noses; and the removal of extraneous substances, which have entered the body; the different stages of inflammation with their treatment, the different forms of wounds and ulcers, and the regimen of patients labouring under surgical diseases. The description of good and bad diet; of prognosis; the kind of messengers to be employed by the sick; and of diseases produced by the deranged actions of the senses, and of incurable diseases. Then follow the preparations required for accompanying a rajah in war, the duty of practitioners, the variety of climates, the different classes of medicines according to their sensible qualities, a description of the fluids, of the different preparations, and of articles of food. These subjects are treated of in forty-six chapters.

2nd.—Pathology, (*Nidana-st'hana*) the symptoms and diagnosis of diseases produced by vitiated humours, or derangements of blood, bile, wind, and phlegm. The symptoms and causes of rheumatic diseases, of piles, stone, fistula-in-ano, leprosy, diabetes, gonorrhœa, and ascites; the symptoms of unnatural presentations in midwifery, large internal abscesses, erysipelas, scrofula, hydrocele, diseases

of the organs of generation, and of the mouth. These subjects are considered in sixteen chapters.

3rd.—Anatomy, (*Sarira-st'hana*), or structure of the body. The description of the soul, and of the elementary parts of the body; of puberty; of conception; of the growth of the different parts of the body; of bleeding; of the treatment of pregnancy, and of infants. This division has ten chapters.

4th.—Therapia (*Chikitsa-st'hana*), describes the symptoms and treatment of diseases, wounds, and ulcers; the history of inflammation; the treatment of fractures, rheumatic diseases, piles, stone, fistula-in-ano, leprosy, diabetes, and dropsy; the manner of extracting the child from the uterus in unusual positions; the arrangement of diet; remedies for retaining and restoring health and strength, and for prolonging life; the means of preventing diseases; the use of clysters, of errhines, and of the smoke of different medicinal substances. These are considered in forty chapters.

5th.—Doctrine of Antidotes (*Kalpa-st'hana*). This explains the means of preparing and preserving food and drink, of distinguishing poisoned food; and descriptions of different mineral, vegetable, and animal poisons, with their antidotes. This division is treated of in eight chapters.

6th. — The supplementary section, (*Uttara-st'hana*) includes various local diseases, not mentioned in the previous chapters, without any scientific order; such as those of the eyes, nose, ears, and head, with their treatment; the symptoms and treatment of fever, and its varieties; dysentery; consumption; tumours; diseases of the heart, jaundice, discharges of blood, and fainting. This is followed by the treatment of intoxication, of cough, hiccough, asthma, hoarseness of voice, worms, stertorous vomiting, cholera, dyspepsia, and dysuria. It also treats of madness, including the kind produced by demons in possessed persons; epilepsy; apoplexy; the different tastes of substances, with their effects; the means of retaining health; and the different opinions of practitioners regarding the humours. These subjects are treated in sixty-six chapters.

The Charaka and Susruta are the ground work of the more recent medical systems; in which their authors have adhered to the arrangement and the general details of the originals. But these imitators, being ignorant of anatomy, and of the usual causes of diseases, are still more defective in their descriptions, particularly when they deviate from the more ancient writers.

It was by means of the works of Charaka and

Susruta that all the sages (Munis) are alleged to have been instructed in medicine; and the variety of opinions to be found in the treatises they afterwards wrote, was in consequence of the shortness of these compilations, their poetical form, and the great extent and difficulty of the subject. These sages are said to have practised medicine as a means of accomplishing much good to mankind; and they became famous by the number of lives which they saved. Those who were taught by Charaka became physicians, and the followers of Susruta, surgeons.

Charaka is superior to Susruta in the accuracy of his descriptions, in the classification of diseases, and in the plan of treatment which he recommends: while Susruta is principally celebrated for his anatomical descriptions, and judicious treatment of surgical diseases. They afford a description of the ancient medical opinions of the Hindus, upon which their more modern theoretical opinions are based; and explain many of the views of the moderns, which would be otherwise obscure or unintelligible from their peculiarity, and the trite manner in which the subjects are discussed. The supposed divine origin of medicine is the reason why the profession is considered as a part of the Hindu religion; and this mingling of divine

and human things is another proof of its great antiquity.

To such authorities the modern Hindu practitioners invariably look, to the neglect of that careful and continued examination of the progress of disease, by which alone its true nature and successful treatment are discovered. The works of these commentators embraced the whole system, and the erroneous principles upon which their theoretical speculations were sometimes built are not detected, in consequence of the contracted space occupied in their descriptions, which discard minute observations on disease, or specific details regarding the opinions of others.

Besides these sacred writings, there are many valuable professional commentaries on different medical subjects, said to have been composed by prophets and holy men, to whom a divine origin is generally ascribed, some written in the peninsula and the south of India, in Tamul, and some in Bengal and the northern provinces, in Bengalee and Sanscrit. These works are chiefly valuable for the explanations of obscure passages, and even these are not always to be depended on, from the ignorance and carelessness of the transcribers.

The two following medical works deserve to be mentioned here: *Bagvhata* compiled a treatise

called *Ostongohreedoya.* This was principally taken from Charaka and Susruta. The manner of treating the subject, and the arrangements are much the same. It is written in a clear style, and the author explains passages which were before imperfectly understood, in the original works. About three hundred years ago, another compilation was made from the most celebrated medical works, and called *Bhavàprakasha.* The author collected all that was most precious from the works left by other sages, and named the work after himself. By its clearness, and excellent arrangement, the obscurities of the more ancient medical shastres, forgotten and corrupted, are in many places explained. This work was compiled for the use of practitioners, and is preferred by them, as it gives an admirable account of all the practical parts of the Hindu medical science.

The following is a list of the principal medical works which are now found in Hindoostan, and were compiled after the great works of Charaka and Susruta. They are arranged in the probable order in which they were prepared: — Aupadhanaha, and Auravhra wrote systems of Surgery; and Todrananda, Chakradatta, Prachararantabali, and Sarangadhara, systems of Medicine. Rájanirghanta prepared a Materia Medica, to which

Drabyaguna added a commentary. Mádhava Nidána, compiled a system of Nosology; Bangaja Ratnávali, a system of Pharmacy; Rasa Ratnákar, a treatise on Metallic Preparations; and Rasendrachintàmani, Rasendrakralpadruma, and Madhumati, systems of Medicine.*

SECTION V.

DUTIES OF TEACHERS

In the ancient works of the Hindus, it is stated that the teachers of medicine were Rishis, or ascetic sages, who often did not instruct more than three or four pupils at one time; in many cases their relations. These pupils were maintained at their own houses, and in many cases the teacher supported them, being satisfied with the honour and merit of bestowing knowledge; which procured for him renown in this world, and the highest benefits in a future state. In some cases an allowance was made to the teacher by their chief, and rich neighbours.

* See, also, Sir Whitelaw Ainslie's Materia Indica; vol. ii, page 491.

The preceptor, during the time he teaches his pupil, is directed to wear two pieces of cloth; his mind should be calm, and he should be regular in his attendance.

By the ancient Hindus the profession of *teacher* was considered of the highest order. It is even stated that "the feet of the teacher is the origin of happiness, and like a light in a dark room, he will illuminate the contracted and dark mind of the pupil; or, as quicksilver, properly mixed with other metals and exposed to heat, will be changed to gold, so will the words that come out of his mouth be pure and valuable." It is stated in another work that a good teacher should possess the following qualifications:—"He should have no defect of body; be clean and neat in his person; be kind and humble to every one; always be ready to expose the good, rather than the bad qualities of others; have a perfect knowledge of the shastres, joined to extensive practical knowledge, and skill; and possess and exhibit to his pupils all kinds of medicines and instruments. He should always be increasing his knowledge of books, and should neither be angry at the improprieties of his pupils, nor fatigued by their importunities. He should be kind and considerate, and be able to explain the most complicated

statements, in the simplest, and most perspicuous language. Such a person as this, who instructs a pupil, when of good parentage, is like the seasonable cloud and rain upon the corn field, which quickly matures its valuable produce."

"Such a man is not therefore decrepid, though his hair be gray; as the gods consider as aged, the person who, though young in years, has read, and understood the vedas. As an elephant made of wood, or an antelope made of earth, such is an unlearned Brahmin—who has nothing but the name."*

Should a teacher give improper instructions to his pupils, or peruse with him bad books, he will bear the weight of the sin of his pupil; and the seeds which he sows will not produce good fruit.

These vaidya teachers are often more learned, and have less pride than the Brahmins.† "They are usually poets, grammarians, rhetoricians, and moralists; and may be esteemed in general the most virtuous and amiable of the Hindus." ‡

* Manu, p. 44, and 156, 157.

† The reverence with which a Brahmin is held is not surprising, when it is considered that they are supposed to be sprung from the mouth of Bramha, that they are the guardians of the sacred books, that all the offices and benefits of religion must proceed from them, and, as gods, they hold the destinies of man at their disposal.

‡ Sir William Jones.

SECTION VI.

CHARACTER AND DUTIES OF PUPILS.

The Hindu physician should teach the sons of Brahmins, of Khetriyas, and of Vaidyas. In all cases, the medical student should be the son of a respectable and ancient family, who is either the son of a physician, or of one who respects the profession. He should possess a mild, amiable, and happy disposition; be of an active, inquisitive, and observant mind; fond of his duties, and not fatigued with his studies; of retentive memory and correct judgment, of a generous heart and possessing true philanthropy. The indications of such qualifications are said to be "an agreeable voice, a small tongue and eyes, and a small and straight nose, with thin lips, short teeth, which do not expose the gums, and thick hair which retains its vigour." With such qualifications, even the son of a Sudra may be taught the shastres, with the exception of certain prayers (mantras). The teacher's faith in God will thus remain, and be conveyed to such a pupil; and the teacher will shed glory over the pupil, even should he be a Rajah, and after death, the teacher will go to the heaven of Indra.

About the age of twelve the aspirant should

commence his Sanscrit studies at the school of some eminent Brahmin, who generally confers gratuitous instructions on four or six young men of his own caste. In these more modern schools they first learn the grammar, named *Mugda-bodha* by heart, without attempting to translate it. This occupies the first three years; and when he has then mastered the Sanscrit Vyakaran, he next studies for two years, *Bhatte*, to exemplify the important rules of grammar; and the heroic poems of the *Baghuvansa*, the *Kumara Sambhava*, the *Naishadha*, and the difficult *Sisupala Badha*, by Magh. Instead of the vedas, the medical student studies the Ayurveda, and the Rajaniti, or instruction of princes, and instead of law, the Niti shastra, or general system of ethics. Their Sáhitya, or Cavya Sastra, contains innumerable poems, written chiefly by physicians, which supply the place of the Puranas, since they contain all the stories of the Ramayan, Bharata, and Bhagavata; they have access to many treatises of Alankára or rhetoric, with a variety of works in modulated prose; to the Nátaka, which answers to the Gandharvaveda, consisting of regular dramatic pieces, in Sanscrit and Praerit. Besides which, they usually, get by heart some entire vocabulary and grammar.

These students of medicine enter their names as the pupils of some celebrated Brahmin or Vaidya, who teaches the science of medicine. When the student has learned one branch of the medical art, or that followed by his father, he is not allowed to change it for another branch, although he can change his profession at any time.

A fortunate day is to be selected for the pupil to commence reading the shastres. On that occasion he is to be clean in his person, and the place in which he is to study should be purified. A raised part of the room or place of study, a cubit square, is to be cleaned with cows' dung and strewed with *Kusa* grass, after which fire is to be placed upon it, with several kinds of sacred wood, upon which ghee is poured, while prayers (mantras) are repeated. The pupil, while being initiated, should stand near the fire, with his face towards the east, if he seeks long life; if exalted fame, to the south; if prosperity, to the west; if truth and its reward, to the north. He must rise first, and go to rest before his tutor.

The guru and other Brahmins are then to pray over some dried rice, and the former should sprinkle water over the assembly. He is then to place a Brahmin on his right hand, over which he prays as he throws a mixture of curdled milk,

honey, and ghee, over the sacred fire. The scholar does the same, and his lesson begins. The guru declares that he must henceforth discard lust, anger, covetousness, ignorance, laziness, vanity, pride, envy, revenge, cruelty, lying, and evil actions. He must always be engaged in the search after truth, and in the performance of good actions; he must be clean in his person, wear an humble and peculiar kind of coloured clothes; and his beard and nails should not be cut during the period of his religious study. Before and after meals, as well as on many other occasions, the student must carefully perform his ablutions. After bathing and being purified, he is to offer fresh water to the gods, sages, and munis; and to convey wood for the oblation to fire. He must always respect his teacher and parents; put the dust of their feet upon his head, and obey them in everything; or he will be unfortunate in this world, and will be born in a degraded position in another life. The pupil should thus be addressed by the guru:—

"When I say you may eat, drink, sleep, or rise from bed, you must immediately obey. If the scholar does not perform all this he sins, his understanding will diminish, and his glory will be quenched. Whatever I say you must believe, and

follow my instructions. You must be careful to act so as to please me, and if I do not acknowledge your good actions, I shall sin and my knowledge will be barren."

"In the treatment of the diseases of Brahmins, gurus, and the poor and helpless, or persons who come from a distance, you must be as careful as you would be of your own relations, by which you will make more friends, and acquire virtue, wealth, and a good name. You must not be displeased at my treating you as a son, a servant, or a beggar, you must harbour no bad thoughts, you must be moderate in the indulgence of your appetites, and contented with a small recompense. By night and by day your anxious desire should always be to consider how you are to relieve and cure the sick under you care. You will avoid bad company, and neither give medicines to a culprit who has been condemned by a Rajah, to a woman whose husband and guardians are absent, nor receive anything but food from a wife, without the consent of her husband. You must avoid entering a house as a medical man, without an invitation; you must walk slowly, without gazing, and observe deliberately, but you must only observe the patient, and the symptoms of his disease; and you must not predict the period of a fatal disease. You must

not vaunt your own knowledge, for although the learned may be pleased, the ignorant will be angry at the exhibition of learning in such a situation. After visiting the sick, should the disease be complicated, you must detail the symptoms, and consult other physicians as to their nature and treatment."

In teaching, the progress of the student must be at first slow, commencing with the nomenclature of the profession, and then acquiring single subjects, and lastly, the whole system. He must first read slowly and distinctly, without much effort, and avoid a monotonous intonation, or acquiring a dislike to the subject. On this account the lesson should be given without pain to the instructed; and a sweet gentle voice must be used by a preceptor who cherishes virtue. When at his lesson, care must be taken not to allow any one to pass between the pupil and teacher, as it will interrupt the supposed passage of good qualities from the latter to the former.

He is next to be taught all the subjects having any relation to medicine; including the theoretical as well as the practical part. He who knows the former, and is unskilful in the performance of operations, on approaching a patient, is like a timid soldier going to battle; and the person well

versed in surgical operations, who presumptuously neglects the theory, does not deserve the esteem of good men. Each is only half instructed, and are equally incapable of exercising the profession properly, is inefficient, and resembles a bird with one wing.

"As the shastres contain the precepts of numerous prophets and great physicians, with their descriptions of diseases reduced to a proper order, you must study them with care; by which the stupid and illiterate pupil will be instructed in his duties, and the intelligent and industrious in the manner in which his knowledge is to be improved and extended.

"The shastres are not to be read at unseasonable times, or on unlucky days, as on the two first days of a new moon; or when the sun is obscured by clouds; when it thunders; at the morning dawn, or evening twilight. The student must not study on holidays, or the day on which he touches a corpse, until purified, or when the governor of the province is sick, when fighting occurs, or when war approaches."

The pupils usually remained for five or six years reading the shastres, attending oral instructions, which were delivered in open places, under the shade of a sacred tree; and assisting at the pre-

paration of medicines, and the treatment of the sick. To increase their experience, they often travelled about with their teachers, curing diseases, seeing the manners and customs of other districts, examining new medicines, noting the influence of different climates and forms of disease, and their treatment.

The successful student should be active in his duties, and not fatigued by his studies, he should possess gravity, a good memory, acute senses, and considerable acquirements. Without such qualifications and indications, the youth should be rejected.

Medicine thus occupied a high rank among the ancient Hindus, being exercised by the second caste, and divided into Medicine and Surgery; a natural and necessary distinction: the former was considered of superior rank to the manual art of Surgery; and as the professional knowledge of medicine was built on the structure of the human body, it was not subject to the religious reprobation produced by the effusion of blood. These were modern ideas; and it is in this degenerate age, that the barber-surgeon, with his few and simple instruments, of which the razor is the ordinary weapon, has taken the place of the ancient, and more scientific surgeon, with his numerous surgical

instruments, with which he performed the most difficult operations.

Mankind was sensible of the vast importance of the medical profession, and medicine was among the sciences earliest cultivated. The knowledge of an important fact, and of a remedy to assuage pain, or the discovery of a principle in the prevention or cure of a desease, was too important not to be recorded; and it was handed down in their families, and modified, or extended therein, according to their experience. Many of these facts were recorded by Hindu sages, and often mixed up with their metaphysical or superstitious fancies. These early annals were related in poetry, and the theories of the sciences and arts had a religious character given to them, which checked that progress which would naturally have been made in the course of probably twenty centuries.

The Brahmins when they have received the string are called Dwija, or twice-born; in like manner, the physicians are called Ambashtha, and Vaidya when they have acquired the Ayur-veda, or medical shastres. Besides his own science, the physician requires to know several others. But if a Vaidya does not know, or does not follow the precepts of the shastres, he will be like a thief; and such a person

exercising medicine, will commit as great a sin as beating a Brahmin.

When a student had studied medicine, and had understood, examined, and committed to memory the symptoms of disease, with the actions of medicines, and had acted for himself, he received the authority of the Rajah to practice medicine.

SECTION VII.

DUTIES OF THE PHYSICIAN AND ATTENDANTS.

There are four circumstances in the cure of a disease that requires consideration:—a qualified physician; a disease that is known; proper medicines, messenger, and attendants; and a reasonable patient.

The duty of a physician relates to his person, character, acquirements, and observances. Susruta informs us, that he who is intended to practice the medical profession should be of a good family, of healthy body, young, handsome, pure, vigorous, modest, discreet, patient, and intelligent. He should keep his nails and beard short, his body

pure, and his clothes clean; and moderns direct that he wear shoes, a small turban, and carry an umbrella and cane in his hand.

The character of the successful student, after leaving his preceptor, should be active and studious, to find out the proper meaning of the difficult passages of the Shastres he has learned by heart. Should these passages not be understood, or should the student know the Shastres, and not the practical part of the profession, he will be like an ass carrying a heavy load of fragrant wood, without discovering and enjoying the fragrance of his burthen.

Should the practitioner not know his duty, the cure of the disease will be tedious and imperfect; it will be desperate when the pulse cannot be felt at the root of the neck, and when the senses are affected. In such cases the practitioner should always inform the relations and friends of the state in which the sick person is, before prescribing.

The physician should always be dignified in his deportment, correct in his manners and habits, gentle and kind, amiable, cheerful, and collected. His language should be mild, candid, and encouraging, rather like that of a friend than an acquaintance, and he should be always ready to assist the sick. His heart should be pure and charitable, and he should carefully follow the

instructions of his Guru, and of his predecessors. Such a physician should possess a character for strict veracity, be of calm temper, and of the greatest sobriety, and chastity. He should be a man of sense and benevolence, and his constant thought should be how he is to do good. A person may be afraid of his father and mother, friends, and master, but not of his physician; so the physician should be more kind and considerate to the sick than a father, a mother, a friend, or a master. To these qualities should be added, that of affection for learned friends, and the constant habit of visiting the sick, and seeing them treated by experienced persons. Without such a combination of qualities, knowledge will retard, rather than advance his progress. He should know the causes and varieties of disease, and the means of preventing and curing them, and have the reputation of accomplishing cures quickly. He should study to remove curable diseases, but avoid treating healthy, or evil disposed persons. A good physician will continue to visit his patient diligently, examine him carefully, and be not fearful, but give medicine always when the patient can live. But if a physician attempts to treat an incurable disease, without proper precautions, it will diminish his reputation, friends, and riches.

A good physician should be thoroughly acquainted with his profession; but, so various are the qualifications, that the combination is rarely to be found, even in heaven. To perform his daily duty, the physician must be particularly acquainted:

1st.—With the introductory remarks of *Sutrus-thàna*, which consider the relation of customs and habits, and the knowledge of those duties which the Shastres regulate, with reference to disease.

2nd.—*Sàrìra-s'thana*, or structure of the body.

3rd—*Nidàn-s'thana*, which includes the invasion and symptoms of disease.

4th.—*Chikita-s'thana* and *upasaya*, concerning the regimen, and the medicines which cure disease.

5th.—*Upadrava*, including all unusual symptoms which develope themselves in the course of disease; as delirium, thirst, &c.

6th.—*Kalpa-s'thana*, concerning poisons.

In addition to such acquirements, the physician must have practised his profession, as well as studied the Shastres, which were compassionately revealed by the gods. Without such a knowledge of books he will be confused, like a soldier afraid in the time of battle, will be considered a great sinner, and should be capitally punished by the Rajah. On

the other hand, a want of practical knowledge will impede his advancement, and his senses will be bewildered, when called on to treat acute diseases. Such a physician will not be esteemed by the great, as he cannot practise with success when only instructed in half his duty. Such a person is the murderer of his species, and the medicine prescribed by him may be compared to poison, or lightning —such ignorance prevents all the good effects of remedies. As the two wheels of a chariot, or the two wings of a bird, assist in their progress, so will the knowledge of the Shastres, and of practice, lead the physician to proceed with safety and success in the treatment of the diseased; but, should the physician want either of these essential qualifications, his progress will be impeded, as one wing or one wheel will impede the progress of the bird, or the chariot. It is the combination of both these qualifications which is required; when medicine becomes like the water of immortality. Such a physician, if he is to acquire celebrity, must still daily endeavour to improve his mind, by an attentive perusal of scientific books; and if he does not gain money, after he has been taught the Shastres, it is his own fault.

When such a *Vaidya* is spoken to by a patient in a peevish or hasty manner, he will remain calm,

mild, and courageous; and cherish a cheerful hope of being able to save the sufferer's life. The practitioner should avoid frivolous or improper language, particularly with females; he should not sit down upon the same bed with them, and the only present he should receive from them is food. He should be frank, communicative, impartial, and liberal, yet ever rigid in exacting an adherence to whatever regimen or rules he may think it necessary to enjoin. Should death occur under the care of such an earthly saint, it can only be considered as his inevitable fate, and not the consequence of presumptuous ignorance.

The presence of a physician for the cure of disease is most important; indeed, as indispensable as a pilot is to a boat, as a coachman in guiding a chariot, or as a general to an army. If a physician is not consulted when a person is ill, he will soon die, as a lamp exposed to wind is continually liable to be extinguished.

Some severe diseases are cured immediately by a good physician; and simple diseases are increased much by the want of early treatment. At the commencement, like a young plant, they are readily rooted up, but as they expand and grow in strength, the difficulties are much increased. Even for a slight disease the assistance of a practitioner will

be of much use; for as a large man at the bottom of a pit may get out by long continued exertion, his extrication will be much facilitated by the assistance of a friendly hand. As in war, a sword may defend many, so in the hand of an enemy it will destroy many. In like manner the Shastres, when imperfectly understood, may become the cause of destruction, instead of benefit, to mankind.

Some practitioners have many instruments and various kinds of medicine which they do not know how to use: such are calculated to deceive; and by their arrogant manners, and being without a knowledge of the Shastres, are enemies to mankind, and are called *Chhadmachara.* Those who possess the favourable qualities of physicians, without the necessary knowledge, are called *Pratirúpaka;* but those who know the medical shastres, and are well acquainted with the causes, symptoms, and means of curing disease, and their prevention, will be fit to be physicians to a Rajah. Such persons are called *Sidhi Sádhaka.* The first two are sometimes allowed to practise by the neglect of the Rajah, and they may be known by their vanity, and their ill-will towards the good physician. Such persons flatter the patient's friends, are diligent, take reduced fees, are hesitating and doubtful in

performing difficult operations, and pretend that their want of success is caused by the bad attendants, &c.; such persons avoid the society of learned persons as they would a jungle.

Still, some patients will be saved when under the care of such a physician, as a worm, in destroying one of the sacred shastres, will sometimes leave in its depredations, the rude representations of some of the sacred letters. A bad physician may cure one patient, by which he endeavours to establish his fame, without considering the thousands he has killed; such a person is like a boat in a storm without a pilot, or a blind man in the performance of any work, and is to be looked upon as the angel of death. If such a fellow has his fancy inflamed, he is like a deadly serpent, and should be avoided.

The practitioner who knows the value of quicksilver, &c., is like a god; one who knows the qualities of herbs and roots is like a man; one who knows the use of the knife and of fire resembles a demon (Asur); and one who knows the proper prayers to be offered up in the time of sickness is like a prophet.

A person will never be respected as a physician, when he is born of a bad family, or inhabits a village which has a bad name, visits the sick

without being called, does not pay respect to the Brahmins, spiritual teachers, or superiors, and speaks on improper subjects. Such a person does not repeat the usual prayers, is ignorant of the Shastres, speaks disrespectfully of the Guru, and neither pays respect to his advice, nor to the predictions of astrologers, to the seasons and times, nor to the influence of the planets, nor acknowledges the power of holy men, yet takes money. The great physician *Dhanwantaree* himself, with such qualities, would not be liked or esteemed.

From these observations, it appears that the duties of a physician require the exercise of sound judgment, profound learning, embracing an intimate acquaintance with many Shastres, unimpeachable integrity, and a constant and extensive practice of his profession. To these qualities must be joined unremitting attention, a good heart and disposition, a knowledge of the appearance and varieties of disease, and the manner of preparing, and exhibiting remedies.

A physician should not visit the enemy of a Rajah; should always speak the truth, avoid speaking disrespectfully of ancestors, and of other good, exalted, and pious persons. He is not to walk with the wicked, foolish, or low-born persons; must avoid riding on wicked horses, elephants, or

the like, living in empty houses, or in places where bodies are burnt, or in very retired places, containing wild beasts or reptiles.

When called upon to attend a patient, the physician is to mark the following circumstances:—He is to observe the manner, speech, and dress of the messenger; the state of the planets; the time of the day; and the good or bad omens. He should note the occurrence of accidents, in walking, or in seeing impure, weak, imperfect or divided objects: In such cases the person will die of the disease. This will be rendered inevitable, should neither presents nor respect be shewn to the practitioner.

Before he visits a patient, he should first remark the position he is in, when the messenger arrives to consult with him; and by the person's countenance and conversation, endeavour to ascertain whether or not the patient will survive. As he proceeds to visit the sick person, he must carefully note any good or bad omens that may occur regarding the messenger, the flight of birds, the relative position of animals, &c. Cows or Brahmins, seen on the right hand side, are favourable, as also corpses, jackals, vessels of water, &c., when seen on the left side. It is unfavourable when lizards are heard when leaving the house,

when vultures or bad characters are seen, or when the physician is called by another person, or is hit by anything behind, or when a person sneezes.

Useful indications are supposed to be derived from the dreams of the physician, as well as from those of the sick person; and a long list of the good and bad subjects of dreams is given. In general, favorable dreams consist in seeing Brahmins, cows, Rajahs, clean water, splendid houses, &c.; and the reverse in seeing a person cleaning himself, low caste persons, dead acquaintances, riding on an unclean animal, killing or fighting unclean animals, falling down a precipice, loss of eye-sight, and other impure objects or defects. The good and bad dreams in different diseases are likewise given.

The physician should first ask questions of the attendant regarding the disease; what things the patient has eaten, and what he has done to produce, or to influence the disease. The physician should then mark the signs of longevity in his patient. These are, long arms and fingers; large eyes, forehead, trunk, teeth, mouth, hands, feet, and shoulders. Persons will live to an old age who have long respirations, and a large space between the mamillæ, the fore-legs short and fleshy, and the neck short, and who speak and act sensibly. A person

with a large body and good voice, deep navel, vessels and joints well formed, much hair on the body, the external ears long, the body strong, more particularly the head, who quickly dries when wet with oil or water from above downwards, and whose senses are good, will live long, and such a person should be treated accordingly by the physician.

It is necessary to recollect that a good Brahmin, or a Rajah, will be cured of a disease with difficulty, as he will not always take the proper remedies, and the physician is afraid to urge his instructions strongly. The same is the case with women, children, and old people, who do not observe the proper directions. In like manner, those who do not explain their complaints, who are weak in intellect, are poor, and avaricious; who will not spend their money, or have bad tempers or dispositions, are dissipated, and are without friends, will be cured of their diseases with difficulty, as they will not strictly follow the directions of the physicians. In such cases the disease may be rendered incurable.

2. *The nature of the disease.* The physician should next mark the nature of the disease, the seasons of the year, and inquire from what country the patient comes. He is to mark which of the humours are diseased, and how they can be

cured. He must cure the diseases of wind or air, bile, and phlegm which occur, without causing other diseases. These derangements are the usual cause of disease, and produce the change of disposition, and the peculiar feelings of the sick; besides, one disease may produce another, which sometimes diminishes the symptoms of the first.

The physician is to observe the general appearance of the sick person, his age, and the condition of his body, his temperament and strength, the state of the mind, and the food which he has been used to. He should examine the symptoms of the disease with his senses; consider the probable result of the disease by his judgment, and its similarity to other diseases—as there is a good and a bad form of every disease. The symptoms as enumerated in the Shastres, should be observed, more especially the state of the pulse, of the tongue, as to moisture and dryness, the condition of the bowels, urine, and sleep; the general feeling, and more especially the state of the nose, head, hands, feet, and abdomen; the state of the patient's appetite and internal fire; the part of the body attacked, and the state of the various vessels (será), and the abdomen (kastha), particularly where the stomach presses upon the food to digest it; where the undigested portion is situated;

where digestion takes place; and where the dejections are retained next the bladder and pelvis. The seat of the blood, the heart, and the lungs are to be considered; and the periods when the disease increases, and intermissions occur. The kind of caste, temper, and disposition; the degree of fear; the state of the humours and blood, the seven essential parts (dhátu), and the evacuations; and, in females, the state of the catamenia, &c. If the patient cannot speak, those about him should be asked the usual questions about the patient.

The disease is next to be examined by the five active senses, and by speech. By the touch is distinguished the feverish heat or coldness of the surface, the dryness or moisture, the softness or hardness, the size of the vessels, and the irregularities of the skin. By the hearing, the passage of air in deep seated abscesses, wounds; and in the intestines, by coughing, &c. By the sight, the changes in the colour of the skin, as in leprosy, and various forms of cutaneous diseases; and the state of the tongue and of the urine. The quantity of this is to be noted, and the quality, which is known by ants being fond of it, by the sight, and by the smell. In like manner, the other secretions and discharges, as from ulcers, &c., are to be examined.

By speech, the practitioner learns the time of invasion and progress of the disease, the sex and habit of the body; the nature and degree of pain; and the state of the appetite, the strength, and the evacuations. Unless the disease is well explained, seen, and known, the practitioner will not understand it, and will be made foolish by his ignorance; whereas the knowledge and judgment of the physician, like a lamp which illuminates a room, enables him to understand the nature of the diseases of the body. But the care of the physician should not end here. In the time of war, he should point out the most salubrious route for the army to advance; the most wholesome water, and the food of the army, as well as of the beasts of burthen, which the enemy may endeavour to destroy by poison. The good physician will detect this, and will be able to afford most useful information on those points, and may be the means of saving the army.

3rd. Medicines and Instruments. Medicines and instruments should always be at hand; and the physician should be allowed to have free intercourse with the sick. When called to a patient, the practitioner is first to remark if there is still life and strength, in the sick person; for as long as life remains in the root of the throat,

and the senses remain perfect, the physician may give medicines, as the person, under such circumstances, may be cured. Even old, inveterate, and incurable diseases may be alleviated by a judicious line of treatment. If, therefore, a practitioner, after the necessary examination, knows the disease, and that it may be cured even with difficulty, his duty is to endeavour to alleviate the sufferings of his patient, by administering medicines; previously stating the danger the patient is in to his relations, lest he bring discredit on himself, and on his profession.

The medicines proper for the individual case, and the manner in which it will be most proper to administer them, must be carefully observed. Care must also be taken that the drugs be obtained from a good soil and neighbourhood. Those from the Himalaya mountains are the best. The physician should know the names and various qualities of medicines; should penetrate forests, and climb mountains, to examine them in their natural situations; and should not despise the information obtained from hunters and shepherds, who may have had opportunities of witnessing their effects.

The medicines should be collected on a fortunate day, and at a lucky hour, by the physician himself, with suitable prayers. Should a person of another

caste touch or prepare the medicines, and not the physician who prescribes them, they will be rendered inert, even should a Brahmin have prepared them; but Susruta states that any competent person may administer the medicine to the sick person. When so prepared, prescribed, and administered at the proper time, the effect will be favorable; but medicine will be of no use unless administered by a physician, as it will be like the lump of prepared clay, without the aid of the potter to fashion it. A physician should, therefore, be his own apothecary, preparing and prescribing those medicines which are peculiarly appropriate to each particular case.

The qualities of drugs depend on their color, smell, and kind of juice; these should be carefully observed, and the medicines given at the proper season and stage of the disease. The physician should also give directions regarding diet and regimen.

It is of much importance that the disease be treated at an early stage, as it is easily removed, when the patient is of strength to admit of the disease being cured. Active treatment should not be employed in a slight disease, nor a mild treatment in an acute disease. Should the treatment employed be doing no good, it should be changed;

but when the symptoms are yielding, under a particular plan of treatment, it should be continued. That kind will be successful which diminishes the disease, by equalising all the humours; and that is bad treatment which increases one as it diminishes another humour.

Should a physician exhibit medicines the first day he has seen the patient, without properly ascertaining the nature of the disease, he will be like the angel of death. Such medicines as cure vital air, bile, and phlegm when diseased, are not disagreeable to the person, do not produce any bad effects, and, given at the proper time, are the remedies to be employed. They should be administered by a healthy dependent, possessed of an amiable character, so as to prevent the machinations of the patient's enemies.

4th. Messenger and attendants. The person who is sent for the physician should be of the same caste as the sick person, and should be dressed in clean white clothes, have a respectable appearance, mild disposition, and a courteous bearing; he should know the lucky seasons, and be acquainted with the Shastres.

Such a person avoids presenting himself before the physician at an unlucky or unreasonable hour, or when fatigued; and he should always be the bearer

of a present for the physician. He must not appear fearful of the result of the attack; but, at the same time, must be exact in his description of the cause and progress of the disease, and careful that the patient takes the medicine, and follows the directions of the physician.

5*th. Duty of the Patient.* A person rejecting a Vaidya or physician, will be punished in hell; whereas when he is employed, the patient will go to heaven, even should he not be able to see the sacred Ganges in his dying moments.

The diseased person will carefully recollect the directions of the physician, must follow them with exactness, and not be afraid of the effects of the medicines which have been ordered.

Should the disease commence at an unfavorable time, or during an unlucky hour, or should the person have been born at an unfavourable moment, he will die of the disease. A patient with a good disposition, with his body of the natural color, and with the signs of longevity; who is patient, has a strong mind and perfect senses, who has no fatal symptoms, and has confidence in his physician, is easily treated, and will have the best chance of being cured. Should the patient be strong, his disease curable, and he have riches to defray the necessary expense, and follow the usual customs

and the directions of the physician; should his mind be favourably influenced by the Shastres, and full of faith in his physician, he will recover. The prognosis will be unfavourable when the sick person is impatient, angry, and disobedient; is wanting in courage, ungrateful, and desponding, and has no confidence in the practitioner. Persons at enmity with the physician, and who endeavour to deceive him, are cured with difficulty, and are to be avoided as much as possible. The patient will die who lives in the house of a person who despises the physician. The different appearances observed on the physician's approaching and leaving his patient will affect his prognosis.

The patient is to expect to be visited in the morning, after the customary prayers and ablutions, is to prepare the medicine as ordered, and is to sit in a clean part of the house, convenient for both the sick person and the physician.

SECTION VIII.

COMPENSE OF THE PHYSICIAN.

The Hindu sage states, that as the increase of our love to God, our riches, our good actions, and our happiness chiefly depend upon the state of our

bodily health, so disease destroys both the beauty of the body and the purity of the soul; and the physician who prevents or cures disease, is considered of great importance to our soul. Should a patient not pay his physician a price equivalent to the value of his soul, then all his holy virtues, and good acts, which he has performed during his lifetime, will belong to the physician. That price will vary with the rank and condition of the patient. Money will be the recompense bestowed by the rich; friendship, reputation, increase of virtue, prayers, and gratitude will be that of the poor. When a Guru, a Brahmin, or a religious mendicant, a relative, an humble and good friend, or one without relations, consults a physician, he must not accept of any pecuniary recompense: His reward, in such cases, will be an increase of knowledge, and the gratification of his desires in having had an opportunity of performing a good action. His cures will ensure the admiration and the esteem of all men; he will be honoured and respected as a master, and after death he will go to heaven; but the physician must avoid administering remedies to hunters or great sinners—such people do not deserve his assistance. His duty is to administer medicines, for an increase of virtue, fame, and happiness as his reward; even when these fail, he is at least

in the way of improving the science, which should always be considered of importance.

Physicians have often been blamed for not attending to their recompense, which embraces love, riches, religion, and happiness, and they lose these benefits by accepting an insignificant sum of money. Hence they say, they exchange a bag of gold for a mass of dross.

CHAPTER II.

PHYSIOLOGY, AND PROPERTIES OF ORGANIC BODIES.

As the Hindu philosophers directed their attention, at an early period, to their own consciousness, they soon detected the distinction between mind and matter; and many of their notions of the supreme being are just and sublime. This power of abstract speculation is very justly considered as the most striking proof of genius; and it is not met with in a rude state of society.

It was unfortunate that the Brahmins fancied that wisdom was something superior to the offices of the world, and was to be sought for in abstraction, and subtile distinctions. Instead of seeking

to correct the passions and sensual inclinations of mankind, they endeavoured to reduce the condition of humanity to its feeblest and most limited state. Thus it was, that the Brahmins neither embellished life, nor purified the mind.

This explains the manner in which the anatomy and physiology of the human mind are treated by the Hindu sages, which will consequently require a peculiar arrangement, embracing a few remarks on the order of creation, as unfolding the principles and elements of the universe, in explanation of the microcosm, or little world—the body. This last will embrace the animal functions of the body, its corporeal materials, senses, and perceptions; the generation and development of the fœtus; the dispositions, or temperaments of the body; the different ages; and death.

SECTION I.

HINDU COSMOGONY.

The great first cause is the infinite, incomprehensible, self-existing being, from whom all spiritual and material matter is derived, and from whom proceeds the universe; being immaterial, he is

above corruption; being invisible, he can have no form or quality, but what we behold in his works. As the beautiful luminary, the sun, casts the rays of his light upon millions of pools of water, and represents himself at the same moment on each of them; our bodies being like the water, and the sun, the emblem of the sovereign being—so are our souls created in the likeness of God: who is without beginning, eternal, unchangeable, occupying all space, knowing all things, and present everywhere; an intellectual inaction in cloudless ether.

Every bliss is thus derived from the inspiration of the great God, which is one with the universe, the instrument of the great will (I'swarra or Ishur) in the creation of the world. By him space was first developed, in which the elements of the world were confusedly mingled together, which he separated, and assigned to each its proper place for the performance of its special office.

The first principle of things, from which all others are derived, is (1) *matter*, (prakriti) nature, the material or creating power of nature, which is blind and purposeless, without form or parts, is eternal, material, universal, forming for itself the yet undeveloped being, from which proceeds the whole visible world. It possesses the qua-

lities of truth, purity, and wisdom (satya-guna); of foulness, passion, and error (rajo-guna); of darkness, inertness, and ignorance (tamo-guna); and becomes enamoured of the spiritual soul.

2. Intelligence (buddhi), is the second principle and the first production of nature (prakriti). It is a free, uncreated, and uncreating principle, which exists everywhere; is eternal, without beginning or end, is invisible, immortal, and only known by reflection; neither wills nor thinks, and possesses no active quality, unless when united with matter, when they are one; and the soul is always pure, when separated from matter. Intellect partakes of the qualities that belong to nature, (prakriti) and if it be good, its properties are virtue, (dharma) knowledge, calm self-control, and supernatural power, (aiswarya) or absolute subjugation of nature, so that whatever the will purposes it obtains.* The one principle cannot be thought of without the other; they form for themselves the yet undeveloped being, and from them proceeds the whole visible world.

3. Egoism, or self-consciousness, (ahankara) the active power of nature, produced by the union of matter and the soul, with their creative and distinctive qualities. Like the ocean which con-

* Wilson's Sankhya Karika.

tains sea-born animals and fishes, so nature has the germ of all created things within itself, vivified by spirit, and its active power.

Elements. (Dravya.) At an early period, the Hindu philosophers reduced the material world to five elementary principles, by the agency of which they explained the appearance, composition, and condition of the world. By them, the deity is supposed to penetrate and sustain the world, and in all objects, one or other of the elements prevails. They suppose, that at the close of the night of Brahma, intellect, called into action by his will to create worlds, performed again the work of creation; and thence first emerged the subtle (4) *ether*. We may suppose that in viewing the wonderful operations of nature, the Hindu philosophers were soon arrested by the beautiful and varied adaptation of design to the end, by the order, harmony, and mutual dependance which pervades the whole world. This seems to have led them to the conclusion that there is no vacuum in nature; and observing that air and the other elements were excluded under various circumstances from space, they devised, in order to account for the separation of particles, a subtle element or ether (akasha) by which all interstices, the most minute and inaccessible, were

pervaded, and to which they ascribed the property of carrying sound (Manu.) This element is invisible, and is only made known through the evidence of the understanding. It is supposed to predominate in the organ of hearing, fills up the porosities of living bodies, and is full of the qualities of goodness. It is supposed to pervade all natural bodies, keeping the molecules from cohesion, and to be the cause of the attraction and repulsion of matter, the emission, reflection, and refraction of light, calefaction, sensation, and muscular motion.

5. By its transformation, the *Air* or atmosphere, the vehicle of sense, was formed; it is possessed of sonorousness, tangibility, and lightness. Having much of the active principle, it gives the moving powers and qualities of bodies. (6) From it proceeded *Fire*, or rather light, making objects visible by the eye, spreading bright rays, with the quality of figure, giving taste and possessing sound, tangibility, and sensibility. The medical properties of fire are its bestowing heat, dryness, digestion, colour, light, and beauty to the body. It also produces the bodily strength and valour of the individual; and from its possessing much of the quality of goodness and passion, it gives lightness and movement to the body.

7. *Water* is the fluid element, possessing taste,

sound, tangibility, and visibility, bestowing the sense of coolness, transparency, light, weight, and smoothness in bodies; and it has much of the quality of happiness and inertness. It forms the different fluids of the body.

8. *Earth* is the solid element, and possesses the properties of odour, sound, tangibility, visibility, and taste. It enters largely into the formation of the body, and of all solid and heavy substances.

These are supposed to constitute the eight elementary principles of creation; in each of which are contained the three qualities of goodness, badness or perturbation, and darkness.

The Hindu philosophers maintained that the creation required a material as well as an instrumental cause. Some supposed the supreme spirit was identical with both; others, that he worked upon atoms of matter, which were eternal. All agreed that the joint operation of matter and spirit, the active principle with the five elements, distinguished by the five senses, constituted the principles by which the universe was formed: at first as an undeveloped mass, from which proceeded, by a regular gradation, the sensitive and the intellectual faculties of man.

Thus the world was supposed to have been raised out of chaos, the seven heavens were formed,

and the other seven worlds were fixed in their places, and order spread over the universe. The creative power first kindled vegetable life, in the humble moss, which rose in its gradual development to the nobler plants, and was succeeded by animal life in its lowest link, the zoophyte rising to the crustacea, the fishes, the amphibia, and followed by creatures of a higher kind, the mammalia, and lastly, by man, the noblest work of the Almighty.

The Hindu sages suppose, that time existed from all eternity with God, could only be estimated when some motive had arisen, and was only conceived by the mind, by means of its own constant progress. They suppose the world will eventually be destroyed by fire, and again absorbed into God!

SECTION II.

MICROCOSM, OR STRUCTURE OF THE BODY.

Hindu philosophers, who pretended to receive their inspiration from the deity, found no difficulty in explaining the science of the creation of the

world; and their ingenious theory was supposed to be equally applicable to the explanation of the formation of the microcosm, or little world, the body; and was used for the explanation of the constitution and fabric of the animal system. They supposed the body was formed of the same elements and qualities as those of the world, and crude, inert matter only known in connection with, and governed by the independent soul. This union produced the active power of nature, "egoism" or self-consciousness, (ahankara) or personal conviction, the belief that I am, by which external impressions are conveyed to the soul. This is the active principle of creating, preserving, and destroying, by which the operations of nature are performed. United in certain proportions with the elementary substances, it forms organic bodies. These are made up of the eleven active or passive organs of sense and perception: sound, distinguished by the ear; feeling, by the skin; sight, by the eye; taste, by the tongue; smell, by the nose; presided over by the mind; which form the intellectual and perceptive senses, by which we acquire a knowledge of the world. The organ of speech, the hands, the male and female organs of generation, the anus, and the feet, are the five instruments of action or sensual

organs, for discharging or removing; and all these make up the twenty-four elements which communicate with the soul by its messenger, the mind. They supposed all animals were gifted with five senses and perceptive faculties; and man alone possessed the reflective faculties, which raise him above the other animals; of these were created males and females, to propagate their species; and each herb and organic beings had seed of its kind, and each condition and organisation had food provided for it from the fruits of the earth, or from other organic bodies.

The mind has the qualities of meditating and searching after divine knowledge; of judging of the individual's past actions and future prospects in this world, and the next; of distinguishing good from evil, happiness from misery, and real from imaginary speculations. Knowledge is conveyed to the ear, containing much of the element of pure ether; feeling, through the skin, &c.; and the perception of sound is conveyed to the soul by means of the mind. These elements and functions give birth to the power of thought and decision. The five senses and actions are all animated by the intellect, which partakes of the qualities; and if of the good quality, its properties are virtue (dharma), knowledge, self-control, and supernatural

power (aiswaraja), which enables the person to accomplish his object, however difficult that may be.

The soul or spiritual essence is supposed to penetrate and sustain the world, being diffused over creation; it exists everywhere, and in everything, and, like the rays of the sun, is continually darting forth to animate organic bodies, and being again absorbed into the great soul of the world.

Those elements of the world nourish the body, and are contained in different proportions in every kind of food. Each element, by an inherent property, joins with that which already forms a part of the organism, in the following manner: the skin, vessels, bone, hair, and flesh, are made up principally of the element of earth; the alvine evacuations, urine, semen, blood, and phlegm, of water; hunger, thirst, and insensibility by fire; motion, conscience, termination of work, and retention of happiness by air; and desire, revenge, stupidity, fear, shame, are formed by an excess of pure ether. There is likewise an active or warm principle, which is increased and strengthened by the rays of the sun, and a passive or cold principle, by the influence of the moon.

The pure, free, and uncreated soul is supposed to exist in all living objects, animating beasts,

animals, and demigods in certain proportions, according to the individual's conduct in former states of existence. This independent soul, the emanation from the great soul of the world, animates the human body for a certain term, not being from God, but of God; and after an uncertain period, when purified from the world's defilement by a long course of discipline and contemplation, the individual may exchange the practical for the spiritual worship, until at length absorbed into the divine essence.

Like a charioteer, the soul directs the senses, regulates the actions of the body, and sustains the living system. By means of the corporal functions and senses, it acquires a knowledge of the external world, and speaks and acts. If the person engage in the performance of good works, after death the soul will reap the benefit in another state.

According to the more fanciful theory of Vedanta-viasa, the soul, and other parts of the body, are supposed to be enclosed in a series of shells. In the first is memory, with the five senses; in the second reason; and in the third life. These constitute the supernatural part of the body, and accompany it in all its transmigrations. The fourth shell is the visible

body. When the person is awake, the soul acts in the visible and actual world. In sleep, the soul is enclosed, but not received into the spiritual being; and in dreaming, there is a figurative and imaginary creation. At death, the soul leaves the body, ascends on high, clothes itself in a watery veil, falls as rain on the earth, is imbibed by some plant, passes through it as nourishment, and animates a new being. When it has finished its transmigrations, and is purified by its good actions, it resumes its union with God.

The observant philosophers of the East, appear thus to have seen, at an early period, that all change from organised bodies was by corruption, and that such bodies dissolved themselves into their original elements—air, earth, water, fire, and ether: and the eternal order of the stars was supposed to influence the flux and reflux going on in animal life.

In combination with mind, the soul is confined to the body by the illusive actions and conditions of virtue and vice, happiness and misery, continence and lust, of piety, morality, and justice, of anger, folly, arrogance, and avarice; of will and understanding; of energy, breathing, and dejection, and of the mental faculties of knowledge.

sensibility, memory, and judgment. The soul is pure; it beholds everything as an indifferent spectator; united with matter, the latter is acted on as the eye is affected by light, the pot of water by the fire, iron by the magnet, fire by fuel, the shadow by the substance, the arrow by the string of the bow: so does the divine particle act through the material organic world, invigorating the five active members, the five perceptive members, &c. In this condition, the soul desires knowledge, and through the channels of the mind, acts on vision, and produces the perceptions of visible objects, through the ear the perception of sound, through the skin, touch, &c.

The effects produced from the soul's communion with the body, and its connection with the mind, are *will*, for happiness and avoiding pain, quietness, and restlessness; and *volition*, that is, desire, malice, love, hatred, knowledge of things and actions, perseverance, industry, reasoning, the discovery of truth by induction, argumentation, and knowledge of sound, touch, &c., which are fixed in the mind by memory. In the form of the active principle, *vaya*, it acts on the movements of the heart, opens and shuts the eyelids, and gives courage, arising from the powers and abilities of the mind. These are the qualities and powers which the soul

acquires and generates, from being united with the body, and connected with the mind.

The presence of the soul is necessary to animate the body, and it is full of knowledge, happiness, and judgment. It produces waking and sleeping, and is endowed with reason and consciousness of right and wrong. When the individual has followed a wicked life, it is not disengaged from the elements, but is again clothed with a body of a different rank, according to the deeds in this world. If very wicked, the punishment will be lengthened, and the soul will again reanimate other bodies more or less elevated according to its sins; and thus will follow transmigrations and purifications, until at last when the soul is disengaged by death, it will be absorbed and participate in the divine nature, where all passion is unknown, and consciousness is lost in bliss. Such a soul will never again reanimate flesh, being absorbed into the great soul of the universe.

The *mind* possesses the faculties of judgment and understanding. By the former, it considers the suitableness and unsuitableness of objects, the goodness and badness of actions, the subjects of consciousness, imagination, happiness and misery; and distinguishes certainty from probability. The understanding takes cognizance of the objects

of perception, under different forms and modes of existence, of the ideas that pass in the mind, and of the determination of realities.

The *senses* recognise objects, being under the dominion of the mind, which determines the merit and demerit of actions, and the qualities of goodness or badness of objects. The mind thus manifests itself by its actions, through the external organs, upon the determinations already formed, by its internal operations.

The microcosm, the body, was supposed to possess parts corresponding to those of the globe, and as the divine will animated the earth, so the soul animated the body. From these opinions a number of fanciful comparisons were made—rivers were the earth's blood, rocks and mountains its skeleton, with its cold and hot regions; and as the body contained in itself types of the laws of the universe, so primary ideas explained the sympathy of the body with the visible world; and its affections by changes in the moon, and the position of the planetary influences, which regulate its condition. The fluids of the body are in like manner influenced by the same planets, which regulate their condition.

Every human being possesses the soul in union with the senses, and by the subduing of these

through the medium of the intellect may attain final deliverance or blessedness. It was afterwards supposed that this was obtained by knowledge through absorption into God (*yoga*), and mystical union with him, and a perfect abstraction from everything which can disturb the mind, and awaken the passions. This fanciful theory proves that the ancient Hindus were careful observers, and acute reasoners; and it contains the germs of many theories, which have pervaded, at different times, physiology and medicine.

The moderate employment of the different faculties retain them in health, and they are deranged by a disturbance in the proportion of the elements, and by too much or too little exercise. But as long as the soul remains in connection with the body, the diseases with which it is afflicted may be removed, and during this time remedies may be administered with good effects.

SECTION III.

GENERATION AND DEVELOPMENT OF THE FŒTUS.

The deity, seeing the earth so full of bloom, and the vegetative power so strong in the seed, called forth a multitude of living bodies, such as plants,

birds, fishes, reptiles, and animals, of which man is the chief. These organic bodies were divided into two great classes, one of which is stationary, and the other is moveable. The former is arranged into trees, with fruit but no flowers; trees with flowers and fruit; creepers; and stationary animals. The second, or moveable organic bodies, are arranged into those which burst their habitation, *adbhaja*:* those produced from the warmth of the earth, as worms, ants, mosquitoes, &c.; from eggs, (oviparous), as birds, snakes, &c.; and viviparous, which are arranged into lower animals and man.

The human body being the object upon which the science of medicine is founded, the process of generation and growth requires a careful consideration; as the mould receives the seed which is to form the future plant, so the menses of the female receive the semen of the male, and germination takes place therein. The menses are stated by the Hindus to be of a red colour, like the blood of a hare; and they should neither stain cloth, when they fall upon it, nor have any smell. They are supposed to be derived from the two vessels of the uterus, which discharge their contents, under the influence of the vital air, into the uterus and vagina. The menses make their appearance, in

* From adbhad, sprouting; and ja, born from, as certain trees, &c.

general, about the twelfth year, and remain till the fiftieth, when the woman is of a weak constitution; but they continue longer when the individual is strong. At the monthly period the female is moist, plump, and happy, with her hair flying about, her eyes languishing; her sides, eyes, arms, breasts, thighs, and navel are in a state of excitement This period continues for sixteen days, when the female may be impregnated. During this time, the mouth of the uterus, like the mouth of the rue-fish, is open as the flower of the water-lily, when exposed to the sun; and as the rays of light concentrated by a lens produce fire, so is generation produced. After this period the mouth of the uterus closes, like the petals of the lily when the benign influence of the sun is absent. This is a curious though incorrect description of germination; as a more careful examination proves that the ovum, detached from the ovary, is received into the fallopian tube, and conveyed to the uterus, and if in its passage it meets with the fecundating fluid of the male, impregnation is produced. If the ovum meets with no fecundating spermatozoa on its passage, it is carried away in the menstrual fluid, which the able Baudelocque says is nothing but a periodic abortion. The Hindu physiologist

thus theorised with wonderful sagacity, so far as his observation enabled him to explain the subject.

During the discharge of the menses, much attention is required regarding the conduct of the woman. During the first three days of the discharge, the woman should remain pure, sit and sleep in a purified situation, avoid cold and fatigue, and eat temperately. Both parents should be young and healthy. The semen conveyed to the urethra of the male, passes into the vagina, is received into the menses, as a seed is dropped into a good soil, and like it, germinates, thus constituting conception, and is nourished, as milk taken into the stomach of the infant nourishes it (Susruta). This theory is very old, and generally received over Asia. In the Wisdom of Solomon,* the germ is stated to be "compacted in blood of the seed of man." When the mixture has taken place, and the resulting body has become solid, by the respective qualities of cold and heat, the soul is added, as the sun shining upon a body imparts heat to it. When the germ has more the qualities of the semen, a male child is formed, and when of the menses, a female child is the result.

Should conception take place on the first or second day of the menses, the offspring will be

* Ch. vii., verse 2.

weak, and often dies soon after birth. When conceived on the third day, the child will be weak and deformed, and will die at an early age. It is when the female conceives on the fourth, sixth, eighth, or tenth days, that the offspring will be strong and healthy.

The signs of conception are interesting, from being so generally correct. During the day on which it has taken place, the woman feels fatigued, languid, and thirsty, with a weakness of the two thighs, a retention of the semen and blood in the uterus, and a throbbing in the vagina.

The signs of pregnancy are these. The skin round the nipples becomes of a dark colour, and the hair upon the body becomes more distinct and prominent. The person feels weak, the eyelids are heavy and closed. Much saliva proceeds from the mouth and nose, and the female has no appetite, feels sick, and vomits. Even pleasant smelling things are disliked, and produce sickness. In this condition the wife must not approach her husband; she must avoid fasting, vomiting, and strong purgatives, grief and fear, stretching and severe coughing, dragging heavy weights, riding on horseback, sleeping during the day and sitting up at night. She must not be bled, nor strain in passing her dejections.

The Hindu believes that a woman may become pregnant by the influence of dreaming, which is considered very sinful.

During pregnancy, the woman should wear white clothes and ornaments, should avoid disagreeable sights and excitement, and live on easily digested food. If she is not gratified with what she wishes to eat, and the wind is deranged, the child will be crooked and crippled, or will be small in size, dumb, or unable to speak distinctly, will be blind, or have his eyes defective, or will be an unbeliever in the sacred shastres. In other such cases, these defects are produced by previous acts of wickedness of his own, or of his parents in a former state of existence. Whatever is wanted by the pregnant woman should, therefore, be supplied, when a perfect child will be born. If the woman desires to see a Rajah, the child will be great and rich; should the mother wish to adorn herself, the child will be well formed and vain; should the mother wish to see a holy man, the child will be holy and just; and if she longs to see ferocious animals, the offspring will be of that description. In like manner the desire for particular sorts of food indicates the disposition of the infant, and the form of his body. When the mother wishes to eat buffalo's flesh, the

child will have bloodshot eyes, and much hair, and he will be warlike; and when hog's flesh, he will be sluggish and sleepy.

If any injury be done to the mother, or if she suffer in any way, the child in like manner suffers. The menses, after conception, go in part to form the placenta, and as the blood flows every month, it coagulates to form the embryo, a layer being added every month; and another portion is conveyed to the breasts of the mother, by which the mammœ are increased in size.

The period of gestation extends from nine to twelve months, ten lunar months being considered the usual period; and this is the time stated in the Wisdom of Solomon, "In my mother's womb I was fashioned to be flesh in the time of ten months." * When the female is not delivered before the twelfth month, the abdominal swelling is considered as the effect of disease.

SECTION IV.

GROWTH AND FUNCTIONS OF THE BODY.

The germ thus formed contains a small proportion of the five elements; each of which assists in

* Ch. 7, v. 2.

promoting the development of the other elements, and of the body in general. The soul is last engendered, like fire produced by a burning glass, the mixture of the menses and semen producing heat. When the *wind* separates the particles of the semen, it produces twins, triplets, &c., and when one of the constituent parts of the embryo is unhealthy the conception will be so; and, if the menses and semen are impure, as when the parents are affected with leprosy, the offspring will also be afflicted with this disease.

The germ in the uterus is like a shrub, the vessels of which are connected with its walls, by which the blood of the mother is circulated in it, and it is nourished. The embryo being near the vital fire of the mother at the navel, is inflated by the wind and fire which it contains, so as to expand into its different parts, forming the vessels, which circulate the juices, from which its members are formed; as the potter gives figure to the piece of clay upon his wheel.

In the first month the mixture of the semen and menses remains liquid, and forms a small mass like a pea; seven days after conception it has the form of a bubble, or inflated bag. On the tenth it is red, and on the fifteenth it resembles a small round piece of flesh. This shortly enlarges in the same

imperceptible way as the moon enlarges in size. At one month it has small fibres proceeding from it, and is animated with life. At the third month the germ becomes of a circular form when a male; of an oblong form when a female; and of an irregular form when a hermaphrodite. Five eminences begin to appear, which, when developed, become the arms, legs, and head. The other smaller parts of the body are then imperfectly formed.

In the fourth month the members are more distinctly developed, and the heart of the fœtus being perfectly formed, gives the power of sensation; life receives its active powers, and has a desire for the assistance of sense and activity, when the elements and the mind appear; life then acts as in its former state of existence. In the fifth month, the powers of the mind are increased, and life performs its usual functions. The nose, mouth, eyes, throat, and abdomen may now be distinguished. At six months all the members are formed, and the understanding is added.

At the seventh month, the body is completely formed, and the members can act separately, and possess life, mind, and understanding. The essence of the strength of the system (ozah) is imperfectly formed, even at the eighth month; and on this account, should the infant be born during this

month, it is incorrectly supposed that it must die. During the eighth month the joints are formed, the parts move on each other, the fœtus requires food, and by the heat of the mother strength is added. At nine months the mind and memory are active, it moves about, and it receives nourishment from the mother; according to some, by means of a vessel which passes from the mother's breasts to the mouth of the embryo; by others it is stated that the turtle-mouths of the vessels of the umbilical cord have a communication with the vessels of the mother, and convey blood to the fœtus, by which it is increased in size.

In the ninth month, the woman is to remove to the small temporary hut prepared for her delivery. At the tenth month the fœtus acquires knowledge, and prays to God, and sees the seven heavens, the earth, and the inferior regions. The approach of delivery is known by the descent of the uterus, and the more flaccid state of the abdomen. The breasts become relaxed, and pain commences in the loins, back, and inside of the thighs, followed by pains in the sides and back, with a mucous discharge. The patient's body should be anointed with oil, and bathed in warm water, and weak warm gruel given to drink. She must now rest on soft pillows on her back, with her thighs and

legs bent. Four old experienced women are to be in attendance, with short nails, and well acquainted with their duties. The vagina and parts should be well smeared with oil. During the pains the woman should be directed to strain, so as to expel the child and secondines. By the wind of the pelvis the fœtus is expelled, as an arrow is shot from a bow, and falls insensible to the ground. All its former knowledge is immediately forgotton, and on losing so many pleasing illusions, it cries. (Jotis.)

Nine calendar months seem necessary for the perfection of the fœtus, that is, thirty-nine weeks, or two hundred and seventy-four days from conception. The Hindu Shastres allow ten calender months, or three hundred days. During the time the fœtus is in the uterus it does not discharge its evacuations, because they are in small quantities, and the wind which discharges them is not present in the intestines. The fœtus does not cry in the uterus, as its mouth is closed by the fœtal membranes, the wind-pipe is filled with phlegm, and there is no passage for air. In the uterus the fœtus sleeps and breathes, and other functions are performed by the mother.

The fœtus in utero is bent on itself, with its head upwards, and its mouth towards the spine

of the mother. Its hands and feet are bent, and during parturition, the vital wind or air turns the body, and brings the head downwards. The uterus is a dark and disagreeable place, which the Brahmins allege is a kind of purgatory. If the mother eats proper food, the fœtus receives from the umbilical cord the nourishment, by which it grows.

The sex of the infant is known by the right mamma containing milk first, the right eye being larger than the left, the woman wishing food of the masculine kind, and dreaming of water-lilies of different species, and by her mouth and her lips being of an agreeable colour. The opposite indications are the proof of an infant being of the female sex. The form of the uterus is more oblong with a female than with a male child. Twins are known by a depression along the centre of the abdomen; and when the two sides of the abdomen are depressed, and the lower end is a little prominent, with a depression in the middle, a hermaphrodite is known to be contained in the uterus.

It is according to the nature, situation, and form, that the different parts of the body are developed. Thus the hair is formed on one part, and is absent at another part of the body. If

the quality of happiness be in excess, the child knows the state it held in its former condition, and does good or bad actions accordingly. The hard substances of the fœtus, as hair, bones, nails, teeth, vessels, ligaments, &c., are produced from the semen, and resemble the same parts in the father; and the soft parts, as flesh, blood, fat, marrow, heart, navel, liver, spleen, intestines, are formed principally from the blood of the mother, and resemble her organs.

The growth and strength of the body, and its different parts, increase naturally, and no individual intelligence is required to effect the functions of the body; its growth and distinction depend on the will of God. But the strength, the different colours, and the duration of life, are produced from the chyle, according to the qualities of the food of different kinds taken by the parents. The senses, knowledge of the arts, happiness, and misery, are produced from the soul, and depend on the parent's good or bad actions in a former state of existence.

The small vessels in the embryo produce at first its growth, before the members are developed. The semen and blood, or embryo, increases, and life enters it; the air divides the different members, the fire prepares the elements, the water moistens,

the earth stiffens, and the sky (akása) increases the fœtus.

The embryo is at first an unformed mass, which contains, however, the rudiments of the future man, both corporal and spiritual. In this mass is first formed a point of blood, which extends and terminates in blood-vessels, which proceed to the right, and to the left, and obliquely. From the blood the flesh is produced, from the flesh the cellular-tissue and fat, from the cellular-tissue the bone, from the bone the marrow, and from the marrow the semen.

When the embryo has hands, feet, mouth, nose, ears, buttocks, &c., it is called the human body.

Saunaka says that the head of the embryo is first formed, because it is the principal part of all the organs of sense. *Kritabirya* says that the heart is first formed, because it is the seat of the mind and soul. *Parasary* supposed that the umbilicus was first formed, because from that centre the other members grow. *Markandeya* says the trunk, and others that the hands and feet are first formed, as they are the root of the active members. *Subhuta* and *Gautana* believed the trunk was first formed, since all the members were connected with it. *Dhanwantaree* says that all these opinions are

incorrect, and that all the members and organs are formed at the same time, but are extremely small and undeveloped; as the first sprig of the bamboo contains the leaves, &c., of the future plant; and as a constituent part of the mangoe, is only visible in its state of ripeness, and cannot be detected when the tree is green (Susruta.)

The head is the first part of the body developed, and hair appears on it, and the parts of it are formed in the following order: The forehead, eyebrows, eyeballs, the black ring round the globe of the eye, the white part of the eye, the eyelashes, and the lower part of the eye are then developed: followed by the ears, orifices of the ears, and surrounding parts; the nose and lips, with the mouth, palate, cheeks, teeth, upper and lower jaws, chin and beard, which are the inferior members of the head. The next member formed is the neck, which supports the head; then the two arms from the shoulder to the fingers; and the trunk with the mammæ. The next part formed is the belly, with the two sides, the back, and the inferior parts under the heart.

From the fleshy parts of the body the fat and blood of the breast are formed, and the fat in the belly. The navel, pelvis, and groin, are the seats of the vessels. The vagina has three spiral turns

like a shell; the third being the seat of conception. The rectum has likewise three spiral turns, with names to each. The anus and lower part of the abdomen form the seventh part developed, and the eighth are the lower extremities.

With the child is ordained his course of life, whether virtuous or vicious; and his acquirement of riches, or experience of the senses, and length of life, will be varied according to the actions he performed in his former state of existence. The acuteness of his senses, the extent of his knowledge, the duration of his life, and his happiness or misery, being produced from the soul; so the strength, colour, health, and memory, will be derived from the nature of the food used by the parents.

As long as the elements, principles, humours, temperaments, muscles, and spirit, remain in due proportion, the perfect action of the system is sustained, and the body remains in health; and when any of them are increased or diminished, disease is produced: to such considerations, and to such alone, the physician should attend.

The internal parts of the fœtus are formed in the following manner: from the elements the eleven senses are produced, to perform their peculiar offices; the liver and spleen are formed from the

blood; the lungs from its froth; and the large intestines from its impurities. Below, on the right side, is the bladder, the seat of thirst, and the root of the urinary vessels. From the blood the gall-bladder is replenished with wind. The essential parts of blood and phlegm are concocted by the fire of the body, into which the wind enters, and forms the intestines, anus, and bladder. The tongue is formed from the essential part of blood, phlegm, and flesh. Wind, with the assistance of a proper degree of heat, separates the soft parts, and forms canals, and passing between the flesh, forms the different muscles. When these canals are filled up with marrow they form nerves. This opinion arises from the Hindu sages supposing that the brain and spinal marrow, are the marrow of the cranial and spinal bones. The wind entering among the soft parts, forms the different receptacles of the body, as the stomach and kidneys, which are derived from the essential parts of the blood. The testicles and their appendages, are formed from the pure part of flesh, blood, phlegm, and fat; and are the support of the canals which lead the semen to the penis. The heart is formed by the essential parts of blood and phlegm, and to it all the principal arteries are connected. It resembles a water-lily, with its head turned downwards. When the person

is awake it is in activity, and when asleep it is sluggish. It is the seat of the understanding; and if the quality of darkness and ignorance predominate, the person sleeps, but when goodness prevails, the person remains awake.

Sleep is a kind of death, and the ignorant sleep much; those who have much goodness sleep about midnight, and those who have much passion sleep occasionally, and without any reasonable cause. When inertness and phlegm predominate in the heart, a kind of sleep (syncope) occurs, from which the individual cannot be awakened. In this it resembles death. Sleep during the day should always be avoided, except during excessive heat, as it is considered a sin, and is unfavourable to health, by deranging the humours and producing disease, such as coughing, asthma, catarrh, heaviness and pain of the body, dyspepsia, fever, etc. Want of sleep at night, produces the diseases of wind and bile. But children and old people, and those who have indulged in any excesses, who have consumption, who drink much, or are much fatigued by travelling, or those who are very hungry, or labour under indigestion, may sleep an hour (forty-eight minutes) in the day time. If the person does not sleep during the night, he

may take half the quantity of sleep before breakfast. Sleep during the day deranges wind, bile, and phlegm, and many diseases are produced by it; as coughing, difficult breathing, &c. Night-watching deranges wind and bile, and produces various diseases; hence, sleep should be taken at night. Sleeping at the proper time will prevent disease, and will retain the heart, as well as the strength, colour, and semen in their proper state. It will also prevent too great leanness or fatness, and a person who sleeps thus, with a good constitution, may live a hundred years.

When phlegm is diminished, and wind and bile increased, by passions; and when any humour of the body is lessened by these causes, disturbed sleep is the result.

If a person regulates sleep by his will, it will not be favourable. A certain period of sleep daily is necessary to health. Too much wind, bile, or grief destroys sleep, diminishes the *dhàtu*, and injures the health of the body. In such cases, oil, with turmeric and other like things, applied to the head and the body, will promote sleep. Bathing has a like effect, as also shampooing, eating good rice, flour, peas, cakes, sweet-meats, oleaginous food, milk, with the juice of flesh, especially that of animals that burrow in the

ground, or the flesh of birds, raisins, and sugar eaten at night. The bed being soft and agreeable, will also promote sleep. When sleep is protracted it is to be obviated by an emetic and a purge, by spare food, and blood-letting. When cough, or fat, or poison have produced it, exercise is to be taken at night. When there is thirst, colic, or hiccough, want of digestion, or diarrhœa, sleeping in the day is proper.

Dreaming. It is the soul which dreams. Whatever was seen or heard when awake, is represented by the mind during sleep, and a dream is the impression of good or bad actions, when there is much passion in the heart.

Drowsiness is indicated by the senses not remaining in their state of activity; the body is heavy, the person yawns, he is tired, is drowsy, and desires to sleep. It is produced by an excess of wind, phlegm, and inertness.

Yawning. When during a long inspiration the mouth is extended, and there follows a short expiration, with tears flowing from the eyes, it is called yawning.

Langour is when the person is fatigued without a cause, and the respiration is weak and imperfect.

Laziness, when the person has the capacity,

without the inclination to act, and wishes enjoyment without exertion.

Nausea is accompanied with an increased flow of saliva and tears, with pain in the breast, and an effort to reject the food; but it does not reach the mouth.

Fainting. When bile and inertness are in excess, they produces this effect.

Swooning is produced by an excess of passion, with bile and air.

Digestion. Six varieties of the digested part of food or chyle are distinguishable. When the food is astringent, sour, moist, &c., the chyle will become of the same nature. When digestion is accomplished, the respective elements unite with those which had entered into the formation of the body; the earth unites with the earth, the water with the water, &c., and these, acting on the inherent qualities of each of the five elements, mix and increase those in the body; smell, the property of earth, unites with that of the body; taste with water, touch with air, and sound with ether (akása.) The juice thus separated from its impurities is called chyle, which nourishes, strengthens, and gives colour to the body.

The chyle is at first aqueous, and then turns red in the liver and spleen, and becomes blood.

The vital functions of the body, and the humours, are strengthened by it, and health sustained. (Susruta).

Some pundits suppose that it requires a day and a night to form and distribute the digested mass, to the last deposited part the semen and menses; others suppose six days are required, and some one month, before digestion is completed. The first class of pundits suppose the fluids are formed and circulated as by a wheel turning round, and supplying the various essential parts of the body. If an article of food or medicine increases much the semen and fluids, it may require only a day and a night to accomplish this; and such an increase cures some diseases of the body. As the beard does not grow, nor the flower yield its smell, at an early age; so in the child, the semen and the menses remain for a certain time undeveloped, which is also the case in old age, as in over-ripe fruit.

The strength or vital principle of the body (*Oja* or *tej*) is situated along the centre of the chest, and is produced by a mixture of a pure fluid; in the same manner as a bee sucks the juice from different flowers, and forms honey, as milk produces butter, and butter ghee, so everything contains more or less tej. This exists as long as

the person lives, and retains the body in its healthy

SECTION V.

AGES.

The Hindu physician recognises three ages—childhood, manhood, and decrepitude; first, childhood extends to the fifteenth year, and is distinguished by three stages:—the first, or suckling year; the second, in which milk and rice are the food; and the third, to the fifteenth year, when the food is rice, and phlegm is in excess.

Second, manhood extends from the sixteenth to the seventieth year, when bile is in excess; and is divided into a period of growth, which extends from the sixteenth to the twentieth year; of youth, from the twentieth to the thirtieth year; of maturity, from the thirtieth to the fortieth year, when all the humours, senses, strength, are in their full development; and of weakness, from the fortieth to the seventieth year, when all the powers of the organs are gradually diminishing, and bile is in excess.

Third, decrepitude extends from the seventieth year till the person's death; during this, the humours, senses, strength, and animation diminish daily. The muscles become soft and flaccid, the hair turns grey, and falls off, the body becomes bent, and the person is afflicted with coughing, asthma, and such diseases. He cannot perform any work; and other signs of decrepitude appear; he is like an old house in the rainy reason with many props. In this period of life, air is in excess, and nervous diseases prevail.

After the tenth year, memory, feeling, sight, semen, strength, and the active senses are powerful; the growth of the body after twenty years, and the perfect state of the body after thirty years. The males are supposed to arrive at their perfection in figure and strength at twenty-five, and the females at sixteen years of age.

The Hindu females become nubile about the twelfth year, when the menstrual charge commences, which ends after the fiftieth year. The discharge continues for three days, (Susruta) and returns monthly. Manu fixes the marriageable age of females at twelve, and of men at thirty years.

In youth and old age, the application of the actual and potential cauteries, and of blisters, and

the use of strong purgatives, etc., are to be avoided; or when required, they are to be administered in a weaker form than usual, and by degrees. In fat individuals, the humours are to be diminished; in the lean, increased; and in the middle-sized, the humours are to be preserved in the same state. The application of the actual cautery should be avoided in very fat individuals, in weak, dry, and thin persons, in individuals subject to fainting fits, and of a consumptive habit, or such as are drunkards, or eaters of opium, or other narcotic drugs. The application of fire should be avoided in persons labouring under amarosis, dropsy, erysipelas, or such diseases, as it will have a tendency to injure.

Some thin persons are strong, and some fat individuals weak. Among all the principles of our treatment, the strength of the person should first be observed; as without it, the administration of many medicines, and the performance of operations are improper.

CHAPTER III.

STRUCTURE OF THE CORPORAL PARTS OF THE BODY.

The human body is made up of six members, consisting of four extremities, the trunk and the

head. The regions are either single or double; the former are the head, front, back, umbilicus, chest, abdomen, chin, and neck; the double are the ears, eyes, nostrils, supercilia, temples, cheeks, shoulders, mammæ, testes, sides, nates, knees, arms, legs, &c. There are, also, ten fingers, and ten toes, and the organs of sense. The body has nine orifices, like a house with doors. They are the urethra, anus, mouth, nostrils, eyes, and ears: the vagina forms the tenth in the female. This is the general division of the body. The particular parts of the body are seven membranes, seven regions, seven elementary bodies, humours, and secretions; also the liver, spleen, lungs, kidneys, heart, anus, intestines, præcordia, organs of sense, large vessels, urinary, and gall-bladder, hair, ligaments, sutures, commissures of bones, capsular membranes, bones, joints, tendons, muscles, parts called vital, vessels, nerves, and organs producing unions.

There are minute parts enumerated, but no correct explanation of a member or region. This is from the defective manner in which practical anatomy was pursued, and parts described.

SECTION I.

DISSECTION OF THE BODY.

The Hindu philosophers undoubtedly deserve the credit of having, though opposed by strong prejudice, entertained sound and philosophical views respecting the uses of the dead to the living; and were the first scientific and successful cultivators of the most important and essential of all the departments of medical knowledge—practical anatomy.

All the Rishis are said to have recommended the dissection of the human body, as proper and necessary. Manu, the great legislator, and the one most respected by the Hindu sages, says (85) "one who has touched a corpse, is made pure by bathing;" and again (77) "should a Brahmin touch a fresh human bone he is purified by bathing; and if there be not water, by stroking a cow, or by looking at the sun, having sprinkled his mouth duly with water."

Charaka, one of the munís and physicians, says, that a practitioner should know all the parts of the body, both external and internal, and their relative positions with regard to each other. Without such a knowledge he cannot be a proper practitioner.

Susruta, a Rishí of the highest rank, says that a jogí (a holy man) should dissect, in order that he may know the different parts of the human body; and a surgeon and physician should not only know the external appearances, but the internal structure of the body; in order to possess an intimate knowledge of the diseases to which it is liable, and to perform surgical operations, so as to avoid the vital parts. As the structure of a tree is known by dividing it, so the structure of the component parts of the body is discovered by its dissection; and it is by combining a knowledge of books with practical dissection, that the practitioner will alone attain an intimate knowledge of the subject of his profession.

The body which is to be examined by dissection should be that of a person who had neither been destroyed by poison, nor had died of a long disease, as the structure of the body will be altered by the deleterious substance taken, or destroyed by the ravages of disease. In like manner the person should not have been very old, and all the members should be in a perfect state.

When a proper body for the purpose has been selected, the dejections are to be removed, the body washed, and placed in a frame work of wood, properly secured by means of grass, hemp, sugar

cane reeds, corn straw, pea stalks, or the like. The body is then to be placed in still water, in a moving stream, where it will not be injured by birds, fish, or animals. It is to remain for seven days and nights in the water, when it will have become putrid. It is then to be removed to a convenient situation, and with a brush, made of reeds, hair, or bamboo-bark, the surface of the body is to be removed so as to exhibit the skin, flesh, &c., which are each in their turn to be observed before being removed. In this manner, the different corporeal parts of the body will be exhibited; but the life of the body is too ethereal to be distinguished by this process, and its properties must therefore be learned with the assistance of the explanations of holy medical practitioners, and prayers offered up to God, by which, conjoined with the exercise of the reasoning and understanding faculties, conviction will be certainly obtained.

The Hindu sages, at an early period of their investigations, while they marked the importance of anatomy, observed the great influence of the state of the fluids in disease; and, imperfectly acquainted with the intimate structure and uses of the various parts of the system, endeavoured to explain the functions of organs by the actions of fluids upon them. With such imperfect know-

ledge, they reduced their medical opinions to an ingenious system, and unfortunately for the cause of suffering humanity, pretended that these works had a divine origin, so that they have remained unchanged and unchangeable, with a branch of their sacred caste as their interpreters. To question the correctness of their facts or deductions, was considered a mark of great presumption and impiety.

This early advancement in the knowledge of the sciences, renders the description of the medical profession among a people so isolated as the Hindus, yet so remarkable for the advanced state of power and learning, peculiarly interesting. It will likewise enable us to trace the extent and modifications of civilisation in a nation unconnected with any other; and prove instructive, as pointing out the means by which such an advancement in the social state was accomplished. Their ignorance of practical anatomy explains their use of so many vague and inapplicable terms. This is peculiarly characteristic of the writings of the East, but the same defect applies to many of the ancient terms employed in Europe. Thus the terms *nus*, *asub*, *shirrah*, are employed by the Hindus to express a nerve, or that which produces sensation. The same word shirrah is employed, with *rug*, to express both an artery and a vein, from their ignorance of the difference

between these vessels; and it consequently expresses blood-vessels, or tubular-vessels. The word, *shirrah*, also signifies a tendon, or nerve; but more generally implies a vein, and is then used in contra-distinction to *dhumennee*, which signifies an artery, or carrier of air, according to *Susruta*. *Nubz* and *nauree* express an artery, without any reference to its functions. The opinion that the arteries carried air, is very old in Europe, as the etymology of the word signifies "air-vessel."

The scanty knowledge of anatomy is likewise evident from the Hindus employing the word *khunt* to designate the throat, including both the œsophagus and trachea, as the English word *throat* is still used in common language; and the term *kulee*, with the Hindus, expresses the heart, liver, spleen, and stomach. This vagueness extends to the diseases of these organs, and explains the often imperfect descriptions in Oriental works, which render it difficult always to identify the disease, and prepare us for the manner in which the modern Asiatics employ remedies, and their want of success in the treatment. In the ancient MSS., however, the descriptions are more accurate, the terminology more perfect, and the treatment more simple and efficacious than in the modern works.

The nature of the pulse is considered of importance for determining the kind and nature of the disease, and the treatment to be pursued; and is carried to an unnecessary extent, with often pernicious consequences, by the moderns.

According to the sacred shasters, the body consists of humours and essential parts, with their appendages, excretions, joints, ligaments, muscles, vessels, cellular tissue, and fascia, organs or receptacles, orifices, skin, and supernumerary parts.

SECTION II.

HUMOURS OF THE BODY. (*Dossoh.*)

The food taken into the stomach is composed of a certain proportion of elements, which are mixed by digestion, to form the humours; these are considered the pillars or supports of the body, and consist of wind, (vayu),* bile, (petta),† and phlegm, (kofa).‡

* *Vâyu*, from *va* to go; was first formed.
† *Petta*, from tapah, hot; from which the heat of the body is derived.
‡ *Kofa, siliso*; from siliso, to embrace.

The wind is supposed to be situated in the pelvis below the heart and navel; the bile in the space between the heart and navel; and the phlegm above the heart and navel. During the morning and in infancy, man is subject to the diseases of phlegm; at noon and in manhood to bilious diseases; and in the evening, and in old age to the diseases of wind. The humours perform the various actions of the body, and when impure, they are the cause of disease, and death; and, with the blood, they retain, and eventually destroy the body. Without these three humours and the blood, the individual could not exist. With the essential parts of the body, and the appendages, and impurities, they form the fabric of the body.

As the moon sheds moisture, and abstracts the sun's rays, which dry up and bestow energy upon the earth, and as the air moves from place to place, so does phlegm bestow moisture, bile withdraws it by its heat, and wind wafts it about in the microcosm, or animal body.*

I. Vàyu, spirit, or wind, flows through all parts of the body, and performs all its actions. It is of the active agent (rajoguna); is invisible, is of a

* This ingenious theory, which has been so frequently renewed, and was for so many ages universally believed, seems to have been derived from the Hindus; from whom it was adopted by the Egyptian and Grecian priesthood. It is defective, however, in excluding the blood, which, notwithstanding, has been stated as one of the fundamental parts of the body.

cooling, and quickly digesting quality, is extremely light, and is always flowing more or less quickly; it conveys the essential parts about the body; performs respiration, and all the actions at the outlets of the body, and maintains the circulation of the fluids, and the activity of the senses, of the organs, and of the understanding. It dries up the fluids, is soft, but is affected by heat and cold; and like the sun's rays, it prepares and separates the fluids and dejections; when mixed with bile it produces a burning sensation; and with phlegm it cools the body. It produces happiness when healthy, and with heat increases the hot state of the system. It is principally found in the small intestines (pukkashaya), thighs, neck, ears, eyes, and other organs of sense, and all the canals, the testicles, and the anus. It produces the active properties of the body and its organs, and retains the body in its proper state. There are five kinds of *air* according to the situations they occupy.

1. Vital air (*Prána Váyu*) which passes through the mouth and nose, and by which deglutition is performed. It is situated in the chest, and is the supporter of *prána*, or life. While this remains in health, so does the individual; it gives movement to the blood, and by it the food and drink are conveyed to the stomach, and strength to the

body; when diseased it produces hiccough, and difficulty of breathing, &c.

2. *Apana vayu* is contained in the rectum, urethra, &c., and is situated under the *pakkashaya*, or place of digestion. It separates the dejections, urine, semen, and menses, and expels the fœtus. It is also situated in the buttocks. When deranged, it produces diseases of the bladder and anus, diseases of the semen, and constipation.

3. *Shaman vayu* is situated in the stomach and small intestines (amassia and puckashaya), performs the digestion of the food, and separates the blood and juices from the urine, alvine evacuations, &c. When diseased, it produces loss of appetite, goolmoh, diarrhœa, &c.

4. *Udana vayu* is situated in the hollow of the neck, above the sternum, and is always directed upwards. In health, it produces speech and singing, and other functions of the voice, above the collar bones. When deranged, it produces various diseases of the upper part of the chest and neck.

5. *Beana vayu* is found acting in conveying the fluids over the body. It produces the flow of the blood, sweat, &c.; and performs walking, jumping, opening of the eyes, conveying, raising, or depressing things, &c. If it be diseased, all the

body becomes affected. When the wind is diminished, weakness is produced; the person speaks little, he is melancholy, and his understanding is diminished, &c. Wind is deranged by excess in venery, study, fasting, or watching, by injuries, as falls and pressure on the body; by severe exercise, as walking much or very fast, carrying heavy weights, jumping or swimming, by riding upon horseback, or on elephants, or in carriages; by using much of sour, pungent, bitter, or dry substances; or light cooling vegetables, flesh, or certain kinds of pulse, &c. Wind may be deranged by the quantity and quality of the food which is eaten, by certain actions of the body, and by exposure to the cold and moist air, early in the morning. If all the varieties of *vayu* are deranged the person dies.

II. Bile *(petta)* is a hot, bitter, oily fluid, having a peculiar smell, like that of raw flesh. It is of a blue colour when in a state of digestion, is sour, pungent, bitter, and light in weight when unmixed, and is hot and pungent, like fire or pepper; and of a yellow colour when properly prepared. It produces animal heat, and it possesses the quality of *Satwaguna*. It is situated principally in the stomach (*amassia*), and small intestines *(puckashaya)*; but it is also found in the

liver, spleen, heart, eye, and skin, where it is mixed with the blood and other fluids. Its principal situation, however, is between the stomach and small intestines, from which it passes to the different parts of the body in which it is found. There are the following five kinds of bile: —

1. *Pacheka* is situated between the stomach and small intestines, and is the bodily fire which Charaka supposes the five elements produce. It digests the food, and separates the chyle, urine, and fæces. It strengthens the internal fire of the belly, and when mixed with the seven essential parts of the body (*dhatu*), makes them soft and powerful. It produces hunger, thirst, taste, light, humours, wind, and strength. It exists in the spleen, in the heart, in the eyes, and throughout the body and skin. It digests the six kinds of food, which it renders more or less nourishing. Its motion being warm, it never produces disease. As the sun shines in the heavens, absorbing water from the pools, so the fire, situated in the navel, shines and digests the food which is taken; and as the sun imparts its properties (*tej*) to the moon, so bile imparts its properties to the phlegm, situated in the stomach. This is therefore like a cooking-pot containing water and food, which is boiled by the heat of the bile underneath it. In this

way digestion is performed, and the blood is rendered more fluid.

When digestion is completed, its qualities are like fire, and it dries up the thin part of the food, is called *onola* or fire, and separates the pure part from its dregs. This fire penetrates and gives strength to the body, and as a candle enlightens objects around, so bile conveys its properties over all the body.

2. The *ranjaka petta* is situated in the liver and spleen; and gives the blood-red colour to the chyle.

3. In the heart it produces sense, memory, and thought, and is called *shadaka.*

4. In the eyes it produces sight, and is called *alochoka.*

5. Situated in the skin, it gives it a shining, clear, and healthy colour, absorbs applications to the skin, and is called *brajoka petta.*

When not deranged, bile produces the sense of sight, digestion, and the functions of organs, by its heating and concocting properties. It produces appetite and thirst, and retains the body soft, giving the proper colour to it; and also produces joy, pride, memory, &c. Bile varies in different seasons; in July and August it is increased; in September and October it is liable

to be diseased; and in March and April it is diminished.

When it is deranged, the internal fire or heat of the body is diminished, as also its colour and digestion. In this case the nourishing chyle (rasa) is not properly separated in the organ called amassia, and produces the undigested dejections called *ama*, or white slimy discharges. If the slime be mixed with wind, bile, and phlegm, it deranges the seven *dhatu*.

The increase of the five elements, and their five qualities, of which the body is composed, will be best understood by following the course and changes of the food when eaten. The food, by means of *pran vayu*, reaches the stomach (*amassia*), where it is softened, mixed with the phlegm, and exposed to heat; the chyle, or pure part of the digested food, is of a milky colour, and is conveyed to the heart by means of the *domonnie* vessels; by the action of the bile it becomes red and sweet in the liver, and is mixed with the blood. Charaka calls these vessels, the chyle carrying vessels (rasyania). By the wind situated in the navel (*samana vayu*), the fire is increased, and it digests the food in the stomach, which becomes frothy and sour; it then passes to the place of bile (*grinni*), which is situated between the stomach

and small intestines. When well concocted by the bile situated there, the food becomes pungent, being mixed with the chyle. It then passes to the *puckashaya*, or place in which digestion is perfected, and is separated from its impurities. The chief part of the nourishment is liquid, and is conveyed to the blood-vessels; while the liquid impurities are conveyed by *shira*, below the navel, forming urine; while the solid crementitial matter is conveyed by *shamana vayu* to the lower intestines, and is expelled at stated times by the anus.

Should the fire be too strong it burns the food, and it becomes sour, and generates bile. When the fire dries the food, it produces a hard mass, which is bitter. After digestion, the prepared food sometimes become sour, by its mixture with substances of this quality. When digestion is not properly performed, the internal fire and strength are diminished; the person becomes weakened, and diseases are produced, particularly the disease which is called *ama*.

When morbidly increased in a body, bile produces a yellowness of the skin, much heat, a desire for cooling articles of food, and a loss of sleep and strength. The person cannot see perfectly, and his eyes, fæces, and urine become yellower than usual.

The hair of a person with such a temperament becomes quickly grey, he perspires easily, his body is pale, his eyes are easily inflamed, and he is impatient, perverse, opinionative, vain, and consequential; he is amorous, his conversation is unguarded, he is addicted to falsehood, is fond of abstruse studies, &c. Bile is deranged by anger, grief, fear, covetousness, malice, great fatigue, fasting, excessive venery, by eating roasted food, or sour, salt, hot or heavy food, or mustard, oil, or cakes, or certain kinds of pulse; by vegetables, fish, flesh, curdled milk, butter-milk, or spirits; also, by exposure to heat of any kind.

III. The phlegm (kofa), is the impurity of the chyle, and is conveyed by the *prana vayu* along the *domonnie* vessels, and mixes with the rest of the phlegm in the body. It is cooling, moist, white, heavy, oleaginous, and glistening, and possesses the quality of *tomoghuna* in excess. It is sweet, but when imperfectly digested, becomes pungent, being prepared by the internal fire, as if boiled in an earthen pot. If deranged by fire, it becomes saltish and frothy. It is principally found in the stomach, in the breast, in the heart, at the root of the neck, in the head, in the eyes, in the throat, and the tongue; and is found in the

joints, in the vessels, and all moist parts. There are five kinds described :—

1. In the stomach (*amassia*) phlegm softens the food, retains chyle of its proper consistence, and pervades and strengthens the different organs.

2. *Abalamvana*, is situated in the heart, shoulder-joint, and arms, and strengthens these parts, and the breast.

3. In the tongue and throat, it produces the various tastes, such as bitter, salt, and sour, and is called *rashana*.

4. In the head, it keeps, by its lubricating qualities, the brain, the eyes, and other organs moist. It retains their respective qualities, and is called *strehena*.

5. It keeps the joints moist and ready to perform their actions, and is called *shlesona*.

If not deranged, it retains the body in its proper state, produces its glistening appearance, and moist state. It strengthens the joints, produces the heaviness and strength of the body, and enters into the formation of semen. The temperament it produces is indicated by a greenish colour, and the person is fortunate, is of a fine complexion, and is fond of sweet things. He is grateful, patient, and is without covetousness. He is

strong, with a white eye, his hair is black, and he dreams of water.

When morbidly diminished, it produces impurities; the body dries, the internal heat is increased, digestion is diminished, the joints move with difficulty, the person is incommoded with thirst, weakness, and watching. In this state, it leaves its natural situations, and passes to other parts of the body. It is deranged by sleeping during the day, taking no exercise, using much of sweet, salt, sour, or cooling substances; by eating oleaginous and heavy articles of food, as milk, the flesh of the buffalo, and those animals which live in water, and living on barley, and various kinds of rice. It is also deranged by eating always the same food, or eating too often, or cooling things of all kinds. This humour is also deranged by the seasons; in November and December it is increased, in March and April it is liable to be deranged, and in May and June it is diminished. When much increased, it produces indigestion, loss of appetite, langour, lassitude, and vomiting.

It is supposed that the phlegm is contained in the parts above the navel, bile in the trunk above the pelvis, and wind in and below the pelvis. In the morning, phlegm predominates, when the body feels cool; in the middle of the day, bile predominates,

when people feel hot; and in the evening, wind is the strongest: at night the same order is observed. When these divisions meet, phlegm and wind are the strongest. In like manner the age of man is divided into three periods; to the fifteenth year phlegm is strongest; to the fiftieth, or manhood, bile is the strongest; and after that, or in old age, wind predominates. In like manner where these periods meet, phlegm and wind are strongest.

The same changes are observed in the seasons, and in the period of digestion of food, and physicians should be careful of them in the employment of remedies. On this account, hot things should be given in the morning, or to the young; cooling things in the middle of the day, or to adults; and tonic and pungent food in the evening, or in old age.

The seven *dhatu* and the impurities remain at rest, and are incapable of movement until acted on by wind (vayu), and are wafted by it over all parts of the body, as clouds are wafted about by the wind, and through its influence they perform their respective actions. The wind (vayu) presides over the ten senses, and is, therefore, the natural lord of all the actions of the body; it acts quickly and strongly, often deranges bile and phlegm, and produces many diseases. It

is diffused everywhere over the body, as well as in the world, of which it is the ruler, performing all the actions in it.

Sometimes the different humours are increased in quantity, either separately, or in combination of two or more together; but bile and phlegm cannot pass from their own receptacles by themselves, without the assistance of wind, which is the only active humour. As a high wind striking upon water throws it about, so vital wind, acting upon the other humours, increases them in quantity, and throws them about out of their proper receptacles. Sometimes they are diffused over the whole body; at other times to some organ which is irritated; and then they cause disease, as the cloud which accumulates over a place, throws down rain there.

If wind be much deranged, it leaves its own receptacle, and passes to another place, producing noise in an unusual situation. Bile in like manner produces heat, a burning sensation, and dryness; when phlegm is increased, and is changed in its position, it destroys appetite and digestion, and produces langour and vomiting. In cases where wind, bile, phlegm, and blood are deranged, and accumulated in the abdomen, they diminish appetite and strength, produce swelling, or

abscesses in the abdomen; at other times costiveness, cholera, dysentery, &c.

If deranged, wind may pass to the receptacle of bile, when medicines for this disease are to be employed for its cure; and bile, when deranged, may pass to that of phlegm, and be cured by removing diseased bile. If phlegm passes to the locality of wind, it is to be cured in the usual way.

When these humours accumulate in the bladder they produce diabetes, stone, dysuria, and other diseases of the urine. When they accumulate in the penis they produce strictures, swellings, &c.; in the anus, fistula-in-ano, piles, and the like; and in the scrotum and testicles, they produce different forms of hydrocele. If in the head they produce the various diseases of the head, eyes, &c.; when collected in the blood and flesh, they produce leprosy, different kinds of cutaneous diseases, and inflammation; in the fat, different kinds of tumours and swellings, particularly of glandular parts; in the bone they produce inflammation, and in the feet elephantiasis, rheumatism, and other like diseases. When diffused over the whole body, fever and other general diseases, as small pox, &c., are the consequence.

If such derangements of the humours remain for some time, their effects may appear afterwards,

and slowly produce the peculiar symptoms of disease.

SECTION III.

ESSENTIAL PARTS. (*Dhátu.*)

The essential parts, or the supporters of the body, consist of the hard and soft parts, and fluids of the body. These are the chyle (rasa), blood (rakta), flesh (mánsa), fat (meda), bone (osthi), marrow (majjá), and semen (sakra). These seven essential parts of the body form the fœtus, lubricate the food, nourish and sustain life, and retain the system in a healthy state; they give the soft feel, colour, and strength to the body, and the action of the senses. When diseased or diminished, the body wastes, and the person dies. Thus the length of life varies with the kind of food which is used. Good chyle produces good health, and with it bravery, strength, and a fine colour of the body, acute senses, and retentive memory.

1. *Chyle* is obtained and separated from the four kinds of food which are digested, and is said to be the essence (sára) of the food. It has a glutinous,

cooling, and liquid quality; is sweet, and is thin, pure, and of a white colour. It is principally situated in the heart, liver, and spleen; and by means of the vessels called dhamanee, it is conveyed to the different parts of the body by the *samána váyu*, and refreshes and nourishes the dhatu. The chyle passes through holes in the large vessels to the heart, liver, and spleen, where it becomes red, mixes with the blood, and assists in the formation of the other dhatu, which it irrigates, as water irrigates plants. When chyle is much increased it produces nausea, and an increased secretion of saliva. There are two varieties — one, *ama* (chyme), slightly impure; and the other, *pakwa* or chyle in its pure state, which nourishes the body; and *mala* are the dregs rejected from the body.

There is a difference of opinion as to the uses of the chyle, some supposing that it nourishes the parts directly, others suppose that by means of vital wind (pran-vayu), it is conveyed to the dhamanee vessels, by which it is sent to the blood, and mixes with it in the spleen and liver, where it becomes red, is purified by the bile, and remains for five days and a-half. It then passes to the flesh, and remains there some time, is purified by the bile, or by a kind of internal fire, is conveyed to the different parts of the body, which it

retains at its proper temperature, and nourishes the flesh. In the same way it passes to, and remains in, the fat, bone, &c., which it nourishes, and purifies with one part; while another impure part (mala) is rejected. Phlegm is supposed to be the impurity of chyle, bile of blood, ear-wax that of flesh. Perspiration is the impurity of the blood in the fat, as the tartar is the impurity of the teeth; and other secretions have impurities which are in like manner thrown off. The last dhatu to which the chyle passes is the semen, which has no dregs; so that the chyle, like sugar, requires different processes to purify it, and at each stage it throws down impurities.

The chyle retains the person in good spirits, increases the blood, &c., but if not properly prepared, from the bile being either too strong or too weak, it becomes pungent, leaves a sour taste in the mouth, and like poison, deranges the dhatu, and produces disease. If diminished, there is pain in the breast, the person shakes, has swimming in the head and moisture in the eyes, with thirst. In one month the chyle changes to blood, flesh, fat, bone, and marrow, from which semen and the menses are produced.

2. *Blood.* The blood is derived from the digested part of the food or chyle, which, after being con-

cocted, becomes red, and is called blood; which combines with and nourishes the other essential parts of the body.

The blood is thin and limpid, like water, has a peculiar smell, is of a red colour, and light. These qualities are derived from the five elements which it contains, and it may be said to be the root of all the elements of the body; as the smell comes from the earth, the fluidity from the water, redness from the fire, mobility from the wind, and lightness from the ether (akasa). When blood predominates it produces redness of the eyes and body, and fullness of the vessels. In a healthy state it keeps the body of a good colour, increases strength, and produces and nourishes the flesh or bulk of the body, the cellular tissue, and fat. It preserves and retains vitality, and distributes it over the body, in different quantities; for vitality resides chiefly in the blood, navel, and semen: when these are weak, so is vitality. Blood is supposed to be chiefly situated in the liver and spleen, from which it is distributed over the body.

The blood is known to be in a healthy state when the nails, eyelids, palate, tongue, lips, palms of the hands, and soles of the feet are of a reddish colour, and of a shining appearance. It retains the fullness and hardness of the abdomen,

gives the yellow tinge to the skin, and reduces the heat of the body. There are two varieties of blood, one of which is supposed to pass to all parts of the body, to nourish it, and to form fat, and its impurity, sweat. The second variety forms flesh, and its impurities, ear-wax.

The blood in the female is changed and produces the menses, which differ from the pure fluid, being formed by the internal fire of the body; and they flow continually three whole days during every month, from the twelfth to the fiftieth year of age.

When the blood is diminished in quantity, the skin becomes dry and rough, the vessels feel lax and feeble; and when increased, the internal heat of the body is augmented, producing fevers and other diseases, in which sour and cooling food and drink are desired.

Blood is never deranged by itself, as whatever acts unfavourably on it, produces first its effect upon the wind, phlegm, and bile, and then acts on the blood. The wind corrupts the blood by making it frothy, dark gray, and thin, and the pulse fast or slow; when corrupted by bile, blood becomes of a brown, yellowish, or greenish colour, and has the disagreeable smell of raw meat; and when corrupted by phlegm, it becomes unctuous, cold, and ductile, (Susruta.) On this account, the

diseases of the blood are cured, by first curing the derangements of the humours.

3. *Flesh* (mánsa, muscles) is produced by wind (váyu) thickening the blood, which is digested by heat. The wind passes through the body, and being accompanied with the proper degree of heat, divides the flesh into different muscles, in which the fine nerves and vessels are lodged that contain blood. By means of these, it proceeds as the lily rises from the ground, and is nourished by water, &c., in its progress upwards. When the blood is digested in the flesh, by the internal fire, its essential parts nourish the flesh, and its dregs produce the wax of the ears, &c. When diminished and dried up in the abdomen, cheeks, and lips, pelvis, thighs, breasts, armpits, nates, and neck, it produces pain, and the principal vessels are diminished in size; when it predominates, it increases the size of the buttocks, cheeks, lips, thighs, arms, and calves of the legs, and gives a general heaviness to the body.

There are five hundred muscles in the body, of which four hundred are in the extremities, and the remainder in the trunk and head. The use of the muscles is to cover, strengthen, and retain in their places the vessels, tendons, bones, and joints, and they are divided into broad and large,

small, narrow, thick, round, long, and short, hard and soft, and smooth and rough.

4. *Fat* is generated by the digestion of the blood by the internal fire. It produces perspiration; is oily and heavy; anoints the tela cellulosa, strengthens and nourishes the bones, keeps the body shining and hard; and is the cause of the growth of the body, its obesity and strength. It is diffused over the body, but its chief seat is in the abdomen, and round the eyes, throat, and breast. Its impuritics are sweat, and, as some pundits suppose, the secretions of the arm-pits, mouth, penis, and vagina.

When the fat is diminished the spleen may be easily felt, the joints seem dried, and moving them gives pain. In such cases, animal food is always desired. When fat predominates, the body appears smooth and glistening, the abdomen and sides are increased in size; cough and asthma are produced, and the body has a disagreeable smell.

5. *Bones* and cartilages (toruna) as new bone, are considered under the same head. It is supposed that the essential parts of the blood and fat produce bone. The fat being digested by the internal fire, is thickened by the wind, and converted into bone; which give form to the body,

and to them all the soft parts are attached. When the bones are all united together, they form the skeleton (kankála). Bone sustains and nourishes the marrow, including the brain and spinal marrow. When digested, the impurities of bone form the nails, hair, &c. When the elements of bone are diminished in the system, the bones become painful, the teeth and nails crack and become loose, and the body becomes dry. Where bone predominates, another portion grows over the old bone; and a more than usual number of teeth are formed.

Some authors say there are 300 (Susruta), others 306 (Charaka,) bones in the body. This difference is owing to their counting the cartilages with the bones. The bones are connected together by capsular ligaments, and are correctly enumerated; which proves that Hindus examined the human body with care.

There are five varieties of bones:—

a. Flat bones, as of the knee, hip, shoulder, cheek, palate, temple, and head.

b. Teeth.

c. Cartilages; as of the nose, ears, neck, and eyelids.

d. Round bones; those of the hands, feet, back, sides, and sacrum.

e. Long bones ; those of the arms, legs, metacarpal, and metatarsal bones, and the other like bones of the body. Bones are insensible and immoveable, and as the centre of a tree is the hardest, so the bones are the most durable part of the body, and remain after all the other parts have decayed.

6. *Brain* and *Marrow.* The brain and marrow are situated within the bones, and nourish them; and their impurities are the secretions from the eyes. The marrow gives strength and the shining appearance to the body, and when it is increased, there is a heaviness of the eye and of the whole body. When diseased, it diminishes semen, and produces pain in the long bones. The essential parts of marrow and brain mix with the blood, and produce semen.

7. *Semen* is the last essential part formed, and nothing is produced directly from it. It is liquid, cold, white-coloured, has the smell of honey, and is the essence, strength, and support of the body, and the root of pregnancy. There is no peculiar organ for the semen, which is supposed to be diffused over the body; as butter is in the milk, and sugar in the sugar-cane. There is a duct on the right side of the urinary bladder, where it is collected, and passes through the urethra at the

time of coition. Like gold purified a thousand times, a drop resembles oil, and may produce pregnancy. Food does not always increase semen; as in old people when wind predominates, which dries up the semen. This retains the body in its proper state of health and strength, is the generative principle, and during its excretion it produces pleasure; when diminished, it causes pain in the penis and testicles, and the person becomes impotent. When it predominates, there is an increased flow, and it produces stone.

Menses. The chyle is supposed, once a month in the female, to be converted into menses (Susruta). The female has desire for the sex during the flow of the menses, and it acts on her as the semen does on the male. So much is this supposed to be the case, that the union of the semen of two women may produce pregnancy, but the fœtus will be born without bone. The menses of the woman disappears after a certain variable period, and likewise when she conceives, when they circulate towards the mammæ, where they are collected and produce milk.

These seven essential parts of the body *(dhatu)*, with the exception of semen, are contained in separate organs called *kolla*, or receptacles.

The blood nourishes the flesh and tela cellulosa, anoints it with perspiration, strengthens and nourishes the bones; and these sustain and nourish the marrow; and the marrow and bones containing it stimulate the voluptuary organs, by their power of nourishing the semen. The semen produces firmness, pleasure, and the germination of the young, and activity and lascivious feeling in a strong person. Life exists in all parts of the body, but chiefly in the semen and blood. Some pundits believe that life is the blood, and others say that life is the *satyo rajo*, and *tamo gunas*, with the five senses, and the soul.

The blood, flesh, and fat, have the qualities of earth in excess; bone, the qualities of wind and earth; marrow and semen, the qualities of water; urine, the qualities of fire; and chyle and milk, the qualities of water in excess.

SECTION IV.

EXCRETIONS (*Málá*).

The excretions are the dregs or impurities of the seven essential parts. The dregs of the chyle is phlegm; of the blood, bile; of the flesh, the

secretions of the ear, nose, &c.; of the fat, perspiration; of the bone, the nails and hair; of the brain and marrow, the secretions from the eyes, &c. The semen has no dregs, but others say that ozah, an oily transparent fluid, which is spread over the body, is the essential support of life, is its impurity; *ozah* is derived from semen, and the essential parts of the seven dhatu. It is heavy, soft, liquid, sweet, cooling, oily, of a reddish or slightly yellow colour, and is diffusible and transparent. It is spread over, and nourisheth the body. If in a healthy state, the body becomes firm, the functions of the organs are performed, a good colour is given to the body, and the external and internal functions, and the organs of sense are retained in a healthy state. When deranged, the person feels languid, with a loss of strength. It is deranged by severe wounds, by the diminution of any of the seven essential parts, by the passions, anxiety, much labour, and hunger. The body then feels heavy, swollen, and drowsy, and its colour changes. If diminished, the person becomes thin, with fainting, delirium, and if destroyed, he dies.

Some authors state, that "oily exudations, seminal fluids, blood, dandriff, urine, fæces, ear-wax, nail-parings, phlegm from the throat,

&c.; tears, concretions in the eye, and sweat, are the twelve impurities of the human frame." * Susruta only allows three excretions.

1. *Alvine evacuations* are the superfluous parts of the nutritious food, which form the fæces; when they are diminished by dysentery, purgatives, or the like, pain is felt in the breast and the sides of the abdomen.

When much increased they produce pain in the belly, with a gurgling noise. When in the proper quantity they keep the body in a sound state, and support the wind and internal fire in a healthy condition.

2. *Urine* is contained in the bladder, and keeps the neighbouring parts moist. When diminished, pain is felt in the pelvis, and little urine is discharged. When much increased, there is a frequent flow, with pain in the pelvis, and swelling in the part.

3. *Perspiration* retains the skin in a soft and moist state. If diminished, the pores of the skin become dry, tough, and deranged in their action. For the removal of this state, warm oil is to be rubbed over the body. When the perspiration is increased there is a bad smell of the body, with itching.

* Manu, p. 164, ch. v., sec. 135.

Milk. When a female conceives, the chyle which produced the menses proceeds towards the mammæ, which enlarge, and contain the food of the infant. When the milk is diminished, the mammæ become lessened, and little milk is secreted, and in these cases, medicines which increase phlegm are to be used. When much increased, the mammæ are enlarged, and the flow of milk increased.

The tears, saliva, and menstrual secretion, will be diminished by much purging or vomiting; and also eating, in considerable, quantities, those substances which diminish wind, bile, &c., will have this effect. One excretion, when constipated, diminishes the others. In like manner, disagreeable food or melancholy, violent exercise, fasting, excess in venery, &c., have the same effect. There is, however, no certain quantity, as they vary in different individuals, according to their size, &c. The increase or diminution of these fluids is therefore stated by comparison. When a man is healthy, all the secretions and *essential parts* are supposed to be in a sound state; and it is the duty of the physician, when they are deranged, to restore them to their just quantity; if increased, they must be diminished; and if diminished, increased.

SECTION V.

JOINTS (*Sandhi.*)

According to Susruta there are 107 articulations; others state there are 68 joints moveable, and 142 immoveable.

Of the moveable kind are the joints of the extremities, jaw, and vertebræ. All the others belong to the second or immoveable class.

There are eight forms of joints:—

1. *Kara*, hinge joint, as those of the fingers, toes, wrist, ankles, knees, elbows.

2. *Udukhala*, are ball and socket joints, as the shoulder and hip joints.

3. *Samudga.* Like the instrument for cutting betelnut; as the shoulder-blade, pubes, and innominata.

4. *Pratara*, as the joints of the neck, and of the back.

5. *Tunnasevanee* (sown as with thread,) sutures of the skull, joinings of the ilium, ischium, and pubes.

6. *Vayasatunda*, the joints of the jaw, which resemble a crow's beak (coronoid process).

7. *Mandala* (round) as of the orbits, throat (larynx) and thorax; in which the eyes, wind-pipe, bronchi, and heart are situated.

8. *Sunkha barta*, like the spiral of a shell; as the ears, and os hyoides.

The flexible parts or joints of the muscles, vessels, and nerves are numerous, but are not stated.

SECTION VI.

LIGAMENTS, &c. (*Snaya.*)

Ligaments bind together and strengthen the flesh, fat, joints, and frame-work of the body, like the strips of ratan which are employed to bind the pieces of a boat together, so as to prevent the entrance of water, and to support heavy weights. Susruta enumerates 900 ligaments; divided into 600 of the extremities, 230 of the trunk, and 70 of the neck and head.

There are four varieties of ligaments:—

1. *Protanobutee*, long ligaments and tendons, as of the legs, feet, and joints.

2. *Britto*, round ligaments and tendons, as of the penis, &c.

3. *Prithu*, thick ligaments and tendons, (aponeuroses) as along the sides, breast, back, and head.

4. *Susira*, are hollows, as in amassia, pukassia, and bladder.

The physician, by knowing exactly the situation of the external and internal ligaments, will be able to remove extraneous bodies, which have penetrated far into their substance.

The *nerves* are included among the ligaments, and are supposed to have their origin in the umbilicus. Five are connected with the five elements of nature, and are influenced by them; and five are subject to the senses. Wounds of ligaments (and nerves) are most painful and dangerous.

SECTION VII.

MUSCLES *(Pashee)*.

The muscles cover, strengthen, and retain the vessels, tendons, bones, and joints in their places.

The sizes of the muscles are very different according to their situation and uses. They are distinguished into broad and large, small, narrow, thick, round, short, hard, soft, smooth and shining, and rough. Susruta describes five hundred.

In these positions the muscles vary according to their actions. The muscles of the penis and testicles of the male, are retained internally in the body of the female. Besides which, there are spiral muscles, like those of a shell; the first circle being the vagina, the second the neck of the uterus, and the third its cavity. In the uterus is contained the fœtus, the mouth of that organ being turned downwards and shaped like that of a *ruefish.*

Tendons (kundura). The principal are sixteen; of which two go to each foot and hand, and four to the neck, and four to the back.

The nails are supposed to be the extremities of the tendons. They also bind the neck, form the penis before, and the buttocks and scrotum behind.

SECTION VIII.

VESSELS.

From the navel proceed all the vessels, and it is the principal seat of life (pran). The navel is the root of the vessels of all living animals, resembling the root of a water-lily, from which

the different vessels arise;* and proceed, like the spokes of a wheel, to all parts of the body, nourishing them, connecting the joints, and conveying the chyle to the blood, as a lake is filled by the rivers which flow into it. Susruta enumerates forty principal vessels, and distinguishes 700 branches: These are divided into three classes, which differ more in their offices, than in their appearance. They are *shira*, *dhamanee*, and *srota*.

1. The *shira* vessels are numerous and of all sizes, and convey wind, bile, phlegm, and blood to all parts of the body, upwards, downwards, and across. They convey nourishment throughout the body, as a garden is irrigated by a small brook. These vessels are all connected with the umbiliacus, and, as a river, distribute nourishment in their course, and keep the body flexible, and ready for action. Of the forty principal vessels, ten contain wind, ten bile, ten phlegm, and ten blood. Each trunk is attached to its own receptacle *(dosa)*. They are of all sizes, and life is contained in different degrees in the different vessels. The middling sized ones contain principally wind.

The ten trunks of vessels which convey wind, are divided into 175 branches; and the same

* This idea is derived from the appearance of the vessels in their fœtal state.

number convey bile, phlegm, and blood, these latter being attached to the spleen and liver, and completing the 700 vessels in the body. Twenty-five branches convey wind in each extremity, thirty-four in the trunk, and forty-one in the neck and head.

The vessels that convey bile, phlegm, and blood are the same in number as those which convey wind. But, in the eye, bile has ten, wind has two instead of four; and in the ears two. The phlegm and blood have the same number. All vessels, however, are supposed to contain wind, bile, phlegm, and blood, but in different proportions. When they contain more wind, bile, phlegm, or blood, they are called wind-vessels, bile-vessels, phlegm-vessels, or blood-vessels.

The colour of wind-vessels is like that of the sun, and wind appears in them; those of bile are blue and hot; those of blood are red; and those of phlegm are cool, of a whitish colour, thick, and their contents seem to remain at rest.

If *wind* circulates properly in its own vessels, the person will act properly, and the functions of the body will be performed in such a manner that the individual will enjoy health; his understanding will be good, and he will possess all the other good qualities of mind.

If *bile* is in a proper condition, the person will have a healthy appearance, his appetite will be good, the internal fire will be strong and healthy, and he will possess other good qualities; as memory, knowledge, and strength. But if it be deranged, the diseases of bile will be produced.

If *phlegm* acts properly the skin will be smooth, the joints healthy, and the strength good; and the person will have the other good qualities of phlegm, such as fatness of the body. If deranged, it produces the peculiar class of diseases of phlegm.

Blood. This fluid produces and nourishes all the other essential parts of the body. If the blood is in a healthy state, the person's colour remains good, the surface of the body is sensitive, and it has the other good qualities of blood, as strength and fatness: and when deranged, it developes the various diseases of blood.

When the wind-vessels alone are deranged disease is not produced, but when they are deranged concurrently with an increased quantity of bile and phlegm, disease is the consequence. By the state of the ten principal vessels the physician knows whether the patient will die or live. There are two vessels in the hands, two in the feet, two in the throat, two in the temples and two in the

nose, which are thus to be examined. In the foot the vessel is behind the maleolus internus, and is in length two fingers breadth; in the hand it is three breadths of the fingers, in the neck two breadths of the fingers, and in the nose two: at these places the pulse is to be felt. In these situations are the vessels containing the indications of life, and a sensible physician will examine them all, and if the wind flows naturally it will be favourable. The two vessels of the hand are, however, the principal; and if their contents flow naturally, the person will live and do well. This wind produces the pulse.* When the pulse is to be judged of, three fingers are to be put upon the vessel at the wrist; the first, next the hand, represents or indicates the condition of wind; the second of bile; and the third of phlegm.

Should wind be deranged in the vessels, sometimes it will be cured by pressing, shampooing, or opening the vessel; these remedies must always be employed.

When wind, bile, and phlegm are deranged, and increased in quantity, they do not remain in the same vessels, but pass into different channels, as into those of one of the other fluid.

* This explains why the physician feels the pulse at the wrist, ankles, temples; and sometimes at the nose or neck.

The vessels carrying principally blood are very red; but are neither very hot nor cold. Some of these vessels may be opened, others cannot be opened with impunity. Should they be wounded, the person will die, or the part will be rendered imperfect in its actions.

There are four large vessels which should not be opened in each extremity, and in the trunk there are one hundred and thirty-six vessels, of which thirty-two should not be opened; four are in the buttocks; three in each side of the spinal column; in the belly four; and in the breast fourteen. Above the clavicles fifty are not to be opened; in the neck sixteen; in the jaw two on each side; four below the tongue, four near the nose, one in the soft palate, one on each side of the eyes, and one in each ear, one in each side of the forehead, two in the temples, two above it, one between the eyebrows; and six in the upper part of the head.

It is stated in some books that there are innumerable vessels, consisting of those of a very small size, which are like the veins of leaves from which the interstices have been removed by decay. They are supposed to arise from the navel.

II. *Dhamance vessels.** These include the large vessels and nerves which proceed from the navel, by which the functions of hearing, touch, sight, taste, and smell are performed.

There are twenty-four of these vessels, according to Susruta, which proceed from the navel, where the vital parts are collected, to vivify the body. There are ten that proceed upwards, ten downwards, and four obliquely. The upper ten perform the functions of sense, and also of breathing, gaping, sneezing, coughing, laughing, speaking, and crying; when these vessels approach the heart, the ten are divided into three each, forming thirty branches. Two of these are divided into ten, of which two convey wind, two bile, two phlegm, two blood, and two chyle. Eight others minister to hearing, touching, seeing, tasting, smelling; two being allowed for each function. By two, speech is performed, two make the noise of the viscera, two produce sleep, two cause waking, two convey tears, two the milk of the female, and two in the male convey semen. These constitute the upper vessels.

2. The oblique vessels are thirty in number, which supply the belly, sides, back, breast, shoulders, neck, and arms, support these parts, and perform their actions.

* A tubular vessel of the body, as a vein or nerve,

3. The functions of the ten lower vessels, situated under the navel, are to carry the wind of the abdomen, for acting on the urine, dejections, semen, menses, and the like. They separate all these parts from each other; and by them the chyle is prepared. These ten vessels become thirty in the stomach (amassia) and intestines (pukassia); two of which convey wind, two bile, two phlegm, two blood, two chyle, two the solid, and two the fluid food; two are for the urinary organs, two for producing the semen, two for conveying it externally, two for the menses; and by two the dejections are discharged.

From these, numerous other branches proceed; the whole body being enveloped by the branches proceeding from the four lateral trunks. These are innumerable, and terminate in open orifices on the surface, and convey perspiration, retain the body in a healthy state, and by their communications, convey external applications into the system. By these vessels feeling is produced, and by them the oil or water is drawn into the system, and they cool, refresh, and clean it.

III. *Srotá (or canals)*. There are many canals in the human frame, which assist the nervous and vital powers. These vessels convey prana, or vital air; food (onna); water (uda); chyle,

blood, fat of the flesh, urine, fæces, semen, and menses. From each of these numerous other vessels arise.

Should the two vessels conveying life be wounded at their root, which is in the heart, the person screams, bends forward, becomes delirious, shakes, reels, swoons, and often dies. Should the two vessels conveying food, the root of which arises from the stomach, be wounded, the symptoms will be flatulency, pain in the abdomen, loss of appetite, vomiting, thirst, blindness, and death.

After digestion, the chyle passes to the liver,* becomes of a red colour in the spleen, and is conveyed through the system to the Dhamanee vessels. There are two vessels which convey *chyle*, the roots of which are in the breast. If they are wounded, the body dries up, and the same effects are produced as when the vessels conveying life are wounded: the person generally dies.

There are two vessels for conveying *blood*, the roots of which are in the liver and spleen, and if they, or the roots of the other blood-vessels, are wounded, the person becomes of a pallid or gray colour, with fever; much blood is lost, and the eyes become red.

* This was the opinion of Gaspar Arselius, who is considered to have been the discoverer of the lacteal vessels in 1615.

There are two vessels for preparing *flesh*, the roots of which are the shira, and the root of the vessels which convey blood. If wounded, they produce swelling, drying of the flesh, and enlargement of the vessels (shira) conveying blood (aneurism), and the person dies.

For *fat* there are two vessels, the roots of which are in the sides and loins; and when they are wounded, perspiration and coolness of the body are produced, the palate dries, the body swells, and there is thirst.

There are two vessels for conveying *urine*, the roots of which are in the bladder and penis; and if they are wounded, the bladder is distended by the collection of urine, and the penis swells.

There are two canals for containing *dejections*, one of which arises from pukassya, and the other forms the rectum. If they are wounded, constipation and a bad smell are produced, and the intestines swell or become knotted.

The *semen* has two canals, the roots of which are in the breast; and two from the testicles. There is a duct on the right side of the bladder, two fingers in length, which communicate with the urethra. If these are wounded, it produces impotency, and the semen is discharged very slowly, and is mixed with blood.

The *menses* have two canals, the roots of which are the uterus, and the dhamanee vessels, which convey the menses. When they are wounded, barrenness is caused, and the menses cease.

SECTION IX.

CELLULAR TISSUE, FAT, AND CERTAIN ORGANS OF THE BODY, (*Jala, nets*).

The cellular tissue connects and surrounds the different parts of the body, and retains the seven essential parts, such as the blood, bile, &c., separate from each other. The humours are contained in the organs, in which they are matured by the heat of the body, for its purposes.

There are seven kinds of Jalas:—

1. *Mangsadhara** is situated between the muscles, and in it the slender tendons (nerves), "and the active and inactive veins rest;" or it is the cellular tissue which surrounds the vessels, nerves, flesh and bones, and divides into branches, to nourish the neighbouring parts, as the lily rises from the ground, and receives its nourishment from the water and earth.

* From mangsa, flesh; and dhara, surrounds.

2. *Raktadhara* * in which the blood is contained, in the flesh, the spleen, and the liver. They retain the blood, as the juice of trees is retained, and is discharged when cut into.

3. *Medadhara* † is the tissue in which all the fat is retained, the chief place of which is in the abdomen (the omentum). In the large bones it is called marrow.

4. *Sleshadhara* ‡ forms the bags containing the phlegm, with which the joints are lubricated, and rendered supple; as oil is applied for the movement of wheels.

5. *Pttadhara*, or digestive organ, which receives from the stomach the four kinds of food, taken by sucking, masticating, drinking, and licking. These kinds of food are digested by the heat of the bile; and these kalá convey the nourishing parts of the food from the stomach to the digestive organs, and the dejections to the sedimental receptacle.

5. *Purishadhara*, or rectum, in which the dejections of the abdomen, liver, and lower bowels are retained.

7. *Sukradhara* retains the semen, which is dispersed over all the body with other fluids. The

* Rakta, blood; and dhara, retains.

† Meda, fat; and dhara, retains. Maja, brain; saroia, marrow.

‡ Slesha, phlegm; and dhara, retains.

principal seat of the semen is two fingers breadth on each side the neck of the bladder; and the semen passes along the urinary passages, and is discharged in a state of pleasure.

SECTION X.

ORGANS OR RECEPTACLES. (*ásaya.*)

There are seven of these receptacles, with an additional three in the female. They retain the humours of the body in their respective situations; such as wind, bile, and phlegm, blood, chyle, chyme, urine, and fæces.

The receptacle of the blood is the heart; under which the organ of phlegm is situated. Still lower down (distid) is situated the stomach (àmàsaya) between the breast and navel. Under which is the (pukàssya), receptacle of bile; below which is the receptacle of wind (pavanàsaya), or place for the excretions;* and below that is the receptacle of urine (vasti, or bladder). The female has three more receptacles, the uterus, and two mammæ, the receptacles for milk.

* Charaka divides these into large and small intestines, and gives each a name.

SECTION XI.

ORIFICES OF THE BODY. (*Rundros.*)

There are nine orifices in the body of the male; the mouth, two nostrils, two ears, two eyes, the anus, and the urethra.

Females have the orifices of the two mammæ, and the vagina, in addition to those of the male.

SECTION XII.

SKIN. (*Twak*)

The skin is said to be in a state of health when it is soft, and has much hair; it consists of seven layers, or membranes; milk when boiled, forms a coating like that of the skin, which gives the seven different kinds of colour to the body.

1. *Avabhàshini* (cutis vera); this is the external layer, and contains the vessels. Its thickness is about the eighteenth part of a grain of barley-corn.

2. *Lohita* is the sixteenth part of a grain of barley in thickness.

3. *Swetà* is a membrane of a white colour, and is the thickness of the twelfth part of a grain of barley.

4. *Tamra* is of a copper colour, the thickness of an eighth part of a grain of barley.

5. *Vedani* is the sensible part, and is the thickness of the fifth part of a grain of barley.

6. *Rohini* is the thickness of a grain of barley.

7. *Mangsadhara*, is the cellular tissue which retains the muscles in their places, and is the thickness of two barley-corns.

These membranes are not found in the head or fingers, but are distinguishable where there is much flesh in the part examined, as in the belly, &c.

SECTION XIII.

SUPPLEMENTARY PARTS.

Principal tendons (kandara) are sixteen in number:—There are four in the feet, hands, neck, and two in the front of the body, and back.

The nails are supposed to be the extremities of the tendons, and one of them forms the pehis.

The tendons of the neck bind the head to the trunk; and others bind the back and buttocks together, and terminate in the testicles.

There are sixteen other tendons which are spread out like a net, in which are contained vessels, &c., which strengthen and bind the joints; and six others which form bundles of parts. There are five suturs in the skull; one in the frænum of the tongue, and another in that of the penis. These, we are told, must be carefully avoided in performing operations.

CHAPTER IV.

POSITION OF THE VITAL PARTS OF THE BODY. (*Marma.*)

Notwithstanding their inaccurate knowledge of anatomy and physiology, the practical experience of the Hindus led them to observe the dangerous, and even fatal results that followed wounds of certain parts of the body. These parts were supposed to contain so much of the vital principle, that they required to be known by the practitioner, so that he may avoid them.

In Susruta, these dangerous parts are all named and described; and the necessity of avoiding them in operations is pointed out. The effects of wounds in the palm of the hand, or sole of the foot; of the testicle, and of the groin; and those of frac-

tures of the bones of the head and breast, &c., are all stated in this practical work.

The vital principle animates the whole body; but it is in larger quantity in five parts: in the flesh, in vessels, nerves (and ligaments), bones, and joints. The flesh has eleven vital parts; vessels, forty-one; tendons, nerves, and ligaments, twenty-seven; bones, eight; joints, twenty.

These parts are divided according to the region. The two legs have eleven in each; the two arms twenty-two; the abdomen has three; the thorax nine; the back fourteen; and above the trunk are thirty-seven.

I. The vital parts of each distal extremity are eleven. One exists in the space between the great toe, and the one next it; and if it be wounded or bruised, the person will die of tetanus. Hence the bite of a serpent is very dangerous in this part. If a wound be inflicted under and behind the fourth and fifth toe, death will be produced with great suffering. If above the heel, and on each side of it, there will be an unsteadiness or shaking of the foot. If under the ankles, it will produce pain and swelling.

When the ankle-joint is wounded, it produces pain, and the joint becomes stiff, and the person lame. When the anterior and posterior part of the leg is

injured, and blood flows largely, the person will die. When the vital part in the knee is hurt, it will produce lameness. A wound three fingers in size above the knee, will be followed by much swelling and stiffness of the joint. From a wound in the middle of the thigh, much hemorrhage will follow, with death, or withering of the thigh; and from one a little above the last, and below the groin, from the great hemorrhage, paralysis of that side will occur.

If the part between the testicles and groin be wounded, the person will become powerless, with a loss of semen.

Both upper extremities have the same vital parts as the lower, differing only slightly from each other.

Wounds in the palm of the hand produce such hemorrhage, as to require amputation of the arm.

II. Vital parts of the trunk are twelve, of which three are in the abdomen and nine in the thorax. In the former, there is one in the anus, and, if it be hurt, it will soon kill the person; one in the urinary bladder, if it be wounded, the person will soon die, excepting after the extraction of the stone. If one side be wounded, a fistula will form, but the person will not die if skillfully treated. Should the vital parts in both sides be wounded, the person will die; if wounded between amassia

and puckassia, where the vessels originate, the person will die. In the thorax there are nine vital parts; one is the heart, which is between the two breasts within the thorax; if it be wounded, the person will soon die. Two parts are situated below the breast, and are two fingers breadth in size; if wounded, death will be caused by the severe cough and asthma thus produced. Above the breast two fingers breadth, if a wound be given, severe cough and asthma will take place, from the viscera being filled up with blood; between the two vessels which convey air, a wound produces a fatal cough and asthma. When a man is wounded under the axilla, a great discharge of blood will precede death.

III. The vital parts of the back are fourteen; should the loins on each side of the back be wounded above the sacrum, from the blood lost, the person will become of a yellow or livid colour, and die. When the sides of the spine near the buttocks are wounded, this is followed by a loss of feeling, and the person cannot move the inferior parts of the body, which become paralysed. When the sensible parts of the two buttocks have been wounded, the lower limb shrinks up, and becomes weakened, and the person dies; when wounded on each side of the trunk and lower part of the abdo-

men (iliac region), the person will die from the loss of blood. When wounded on each side of the spine, near the breast, the person will die from the great hemorrhage. When wounded at the upper part of the spinal column, the person's arm becomes insensible and immoveable, and dries up; if he be wounded about the shoulder, or if the shoulder-joint be wounded, it disables the arm. These vital parts are double.

IV. Vital parts above the trunk are thirty-seven, of which two are on each side of the trachea; there are four vessels called neela (blue), and two (manya); if these be wounded or bruised, the person cannot speak, or the voice becomes changed, and he loses his taste. If the two vessels, (Sira) on each side of the neck, be wounded, the person will soon die. Or if the joint between the head and neck be wounded, the head will be always in motion. If wounded under the lobe of the ear, the person becomes deaf. Should the inside of the two nostrils be wounded, he cannot smell. If diseased or wounded below the extremities or above the eyebrows, the person will become blind. If wounded in the temples, the person will soon die; if above the temples, the individual will live as long as the instrument is in the wound, but if it be removed he will die: it should

be allowed to remain, and medicine be given to discharge the instrument, it may drop out of the wound, and the person may live. Between the eyebrows, the same effects will be produced as in the last case. If either of the five joints of the head be wounded, it will produce fear, insensibility, madness, and death. Should the vessels at the union of the eyes, nose, ears, and tongue, be wounded, the person will soon die. Inside of the upper part of the head, at the passage of the vessel along the bone (lateral sinus), wounds will soon destroy the person.

In operations, vital parts are to be carefully avoided, as the life of the patient will be more or less endangered when they are wounded. When a member is cut off, the parts contract, and less blood will often flow; but if it be wounded in a vital part it will generally cause death, by the number of vessels that are divided, while the deranged wind produces much pain. The person dies in such cases, as a tree will die if the roots be divided. Hence, if the vital parts be wounded, as in the palm of the hand, the arm is to be amputated to save the individual's life. Should a person live after such injuries, the parts will be left in a state of weakness, and his recovery will depend entirely upon the skill of his medical attendant.

If a bone of the head or breast be broken and depressed, it is to be raised or removed by the assistance of instruments. Wounds of the legs or arms will not be fatal, if the vital parts have escaped. In these vital parts, the qualities of the moon, wind, strength, and rajo, satyo, and tamo gunas, and also life are retained in considerable quantities. Hence the fatal effects which usually occur from injuries to these parts. The senses become imperfect or destroyed, the understanding becomes changed, and various kinds of pain are produced in such wounds, followed by death. When the fatal termination of wounds of vital parts is prevented at the time of the injury, death will be produced some days after, with much suffering and weakness. In those situations, where injuries do not produce fatal consequences, but an imperfect action of the part, they are cured by the skill and care of the surgeon. When the wound is near a vital part, the experienced surgeon will examine and avoid those parts, while removing the instrument, by which he will diminish pain, and retard, if not prevent, death. With a bad surgeon, the person will become a cripple, or die.

There are five varieties, or degrees of vital parts, enumerated in the shastres. In one degree, the person when wounded, dies quickly; of such parts

there are nineteen; in another, in a few days, of such there are thirty-three; in a third, when an external substance enters, and produces a fatal effect as soon as it is withdrawn—there are three such parts; in another, a wound produces lameness —there are forty-four of this kind; and in another it produces only pain—of such parts there are eight.

When any of these parts are injured, it deprives the individual, of the portion of life they contain. Those parts, whose wounds produce death suddenly, have the qualities of fire and wind, which quickly destroy life. When life is destroyed only on the instrument being withdrawn, which had inflicted the wound, it is in consequence of the part having the qualities of wind (váyu). In this case, the external instrument presses up the wind, &c., and as soon as it is removed it escapes, and the person dies. That part, which, when wounded, produces pain and lameness, has the qualities of the moon; as it is cool, and steady, and retains life. That which produces pain has the qualities of fire and wind, by increasing which, the pain is produced. Some pundits suppose that pain is produced by the injury of the five elements.

When the five varieties of sensible parts of the vessels, &c., are wounded, the effect is increased by the number, and the person dies. If only four

are wounded, he will live a few days. When three are wounded, and the instrument is removed, the person will die soon after its extraction. If two are injured, an imperfect action of the part will be the consequence; and if only one be injured, there will only be pain.

These five varieties of vessels are generally contained in sensible parts, and retain the body in a healthy state; but if the sensible parts are wounded the wind is increased; it passes through the four species of vessels, produces much pain, and causes fainting and death.

If the vital parts are wounded towards their centre, it will produce death in a few days; and an imperfect action of the part, when they are wounded on one side. Those vital parts which produce death on the instrument being discharged, when wounded near the edge, will give much pain. The other parts give pain when wounded directly, but will produce little pain if wounded on one side.

The same symptoms and consequences will take place, should the parts be lacerated, crushed, or burnt, as when wounded by a cutting instrument.

The care with which the sensible parts of the body are enumerated, and the consequences of

these injuries, prove how carefully the observations were made and accumulated; and it was only when they reasoned on the symptoms of these injuries, that their theoretical fancies were added.

CHAPTER V.

DISPOSITIONS AND TEMPERAMENTS OF THE BODY.

The opinion of the Hindus as to the formation and condition of the world, afforded a natural means of explaining the temperaments and qualities of the body. The preponderence of one or more of the humours, and the qualities of goodness, passion, and inertness, arising from crude matter, explained the peculiarities of habit and character; and as more varieties existed than the simple diminution or excess of these humours would explain, they supposed that the dispositions of the gods, demons, sages, and lower animals, produced the other peculiarities of character. This agrees with the notion of the soul animating different kinds of organic nature, and producing the three varieties of disposition (gunos.)

1. The happy disposition *(Satwa-guno*)*, when

* From *Satwa*, good; and *gun*, a quality.

in excess, affords light, and produces knowledge and happiness. A person thus endowed, avoids bad, and strives to perform good actions. He has patience, is a lover of truth, holiness, faith, knowledge, and understanding; has no bad desire, possesses a good memory, is charitable, just, firm, and devoid of anger, and is contented, and without avarice. When wisdom appears at all the gates of the body, it proves that the *Satua-guno* predominates; and when such a person dies, his soul is conveyed to the regions of those immaculate beings, who are acquainted with the Most High; he becomes a *Deva*.

2. An active disposition (*Raja-guno**), imparts desire, the love of gain, industry, and commencement of works. It produces unhappiness when in excess. Such a person is miserable, insincere, wants veracity, is unquiet, unforgiving, and prevaricating. He has no mercy, is rash, haughty, proud, lascivious, intemperate, passionate, changeable, and covetous. When such a person dies, his soul reanimates another body, of a different, and of an inferior nature.

3. An inert, proud, or wicked disposition, (*Tama-guno*†) in excess, is indicated by a want of

* From *Rajah*, to desire; and *gun*, quality.
† From *Tama*, darkness; and *gun*, quality.

energy, or loss of consciousness, and love of retirement, secrecy, and distraction of thought. He neither believes in God, nor in another state of existence; is a great sinner, is without understanding or knowledge, so as to be unable to take care of his wealth; and is sensual, wicked, slothful, procrastinating, and stupid. When such a person dies, his soul is conceived again in the womb of an irrational animal.

Each of these dispositions qualify the incorruptible spirit of the body. The *Satua-guno*, being pure, clear, and free from defects; should be propagated, inspires the soul with sweet and pleasant consequences, the fruit of virtue and wisdom. The *Raja-guno* is of an avaricious nature, arising from the effects of wordly desire, and imprisons the soul by means of the feelings produced by action; and the *Tama-guno*, being the offspring of ignorance and vice, is the confounder of all the faculties of the mind. As one or other of these qualities abound, so will the character of the individual vary. A combination of these qualities is called prikertie.

The following is the Hindu theory of the *temperaments*:—At the time of the mixture of the semen and female blood, whatever humour, whether wind, bile, and phlegm, is in excess produces that par-

ticular temperament. Hence there are seven temperaments, one being produced by an excess of wind, another of bile, and a third of phlegm; a fourth, fifth, and sixth, from an excess of two of these humours; and a seventh temperament is produced by an excess of three humours—wind, bile, and phlegm.

1. When wind is in excess, the person is not inclined to sleep, or to become warm. His disposition is bad, and he becomes a thief; is proud, and has no honor; is always singing and dancing; his hands and feet split, his hair and nails are dry, and he is always angry and boisterous. He speaks untruths, he is always grinding his teeth and biting his nails, is impatient, is not a firm friend, is changeable, and forgets good actions. His body is slender and dry, he always walks fast, is always in motion, and his eyes are always rolling. He dreams that he is flying about, his friends are few, and his riches are of little value. Such persons as have an excess of wind have the disposition of the goat, jackall, hare, camel, dog, vulture, crow, and ass.

2nd. A person with an excess of bile perspires much, and he has a bad smell. His skin is of a yellowish colour, his flesh is soft; his nails, eyes, palate, tongue, lips, and the palms of his hands,

and soles of his feet are of a copper, colour; and his hair becomes soon gray, the upper part of his head bald, and his skin wrinkled as if by age. He eats much, and dislikes warm articles of food, is soon angry, and is as soon pacified, is of moderate strength, and does not live long. His memory is good, he is a good man of business, and speaks accurately, and to the purpose. His appearance is fine, and in company he excels in speaking. He dreams of gold, and yellow flowers, fire, lightning and falling meteors; dislikes saluting a person, and is angry at others not doing so, is never content, &c. His disposition resembles that of serpents, owls, cats, monkies, tigers, and bears.

3. Phlegm in excess produces a light greenish or blue colour of the body. The person's fortune is propitious, he is pleasant to look on and handsome, likes sweet things, is grateful, constant, just, and forgiving, and is not covetous, is strong and understands with difficulty, and is a placable enemy. His eyes are white, his hair is fine, black, and waving. He is wealthy, and his voice is strong and loud. He dreams of lilies, geese, and large fine tanks. The angles of his eyes are red, his colour is pleasing, and his members are well formed. His regard mild, his disposition is very

good (satua-guno), and he is charitable. He is active, honours respectable persons, and is kind to them; and knows the sciences. He retains his friends, and his health remains constant; he is careful, but gives much. He is of the nature of Bramha, Indra, Shiva, and Varuna; of lions, horses, elephants, cows, and bulls, and of the bird upon which Vishnu rides (Garura, something between a man and a bird, like a goose).

When two or three humours are in excess, they are known by the combination of the two or three classes of symptoms.

Some suppose that the disposition is derived from the elements of the body. In this case air, fire, and water resemble the temperaments of wind, bile, and phlegm; and the temperament of earth produces a large and strong body, and the person can suffer much. When there is an excess of pure ether the man is holy, and lives long, and the external openings of the body are large.

CHAPTER VI.

ON DEATH. (*Mrityu.*)

According to the Eastern sages, death is the separation of the soul from the body. There are

one hundred and one ways in which a person may die; one of which, at the time appointed, is natural death, which takes place about the hundredth year of age: the others are accidental, which occur from numerous causes, as bad living, intemperance, poisons, fire, lightning, drowning, sin, &c.; which are to be guarded against by care, medicines, and prayers.

Man is like a coachman driving his own carriage; if this be well made, and if he continue to drive cautiously, it will go a long time; but, if he drives it upon bad roads, the wheels will get injured, and the carriage will be soon worn out.

Should he indulge too much in the gratification of the senses, he will die like a deer, which is supposed to be deluded to its destruction by the sweet sounds of the lute, which the hunters use; should he indulge in lust, like the elephant; in sight, like the butterfly in approaching the lamp; in smell, like the bee, which is inclosed and crushed in the flower, which has attracted it by its smell; and in taste, like the fish by the fisherman's hook. So beware of indulging too much in any of the pleasures of sense, else it will lead, in like manner, to your destruction.

The wise and foolish, the great in rank, and the

low in condition, all die in the same way. As a rich man has more foresight than the poor and ignorant, so the former is more anxious about his death, which must happen to all; but it is the holy man who has least dread of its occurrence, from being more prepared than others for the necessary change.

At the moment of death the material elements of the body separate, and the soul, which is invisible, resembles the form of the body it had inhabited, and retains the organs of sense and of action. On separating from one, it joins itself to another, and according to the actions the person had performed in his former state of existence, so will be his future condition. As a seed of an inferior or superior order, so will the plant be; thus the soul may animate a man who will grow old in a deformed and diseased body; with a mind wicked and miserable. This union of the liberated soul, and its juncture with the seed of another body, takes place immediately; as a leech on leaving one piece of grass, must immediately attach itself to another. Thus that immutable Power, by acting and reposing alternately, revivifies and destroys, in eternal succession, this whole assemblage of immoveable and locomotive creatures.

As the body is continually changing in its

progress through life, so death is merely one of these changes. The body is frail, but the soul is incorruptible. They say that a person is dead; that this individual is murdered: but these are foolish expressions! The body is alone destroyed, not the soul; as it only changes its position, like a person who casts off his worn-out garments. Cutting instruments may wound him, water may purify him, and air may dry him up, but the soul remains always the same. Those who are born must die, and whoever dies must be born again; and as the elements were invisible and separated before the formation of the body, in like manner they are again separated and dispersed upon its dissolution.

Death is always near; and, since the body, like a mansion infested by age and sorrow, the seat of maladies, harassed with pains, haunted with the qualities of darkness, and incapable of standing long; such a mansion of the vital soul let its occupier always cheerfully quit. (Manu.) The same idea is thus expressed in another Sanscrit work: "The wise man meditates on the acquisition of knowledge and riches, as if not subject to sickness or death; and cultivates virtue as if death had already seized him by the hair." (Hitopadesha.) "When a person leaves his corpse,

like a log or a lump of clay, on the ground, his kindred retire with averted faces; for, in his passage to the next world, neither his father nor his mother, nor his wife, nor his son, nor his kinsmen, will remain in his company: his sins and virtues alone will adhere to, and accompany his soul. Continually, therefore, let man acquire virtue, for the sake of securing an inseparable companion with which he may traverse a gloom—how hard to be traversed! Single is each man born; single he dies; single he receives the reward of his good, and single the punishment of his evil deeds." (Manu.)

Beatitude is to be obtained by the coercion of the members, by abstaining from hurting and afflicting, or giving pain to sentient creatures; and thus the individual becomes fit for immortality. (Manu.) When the vital soul has been purified by the good deeds which have occurred in the body, it is absorbed into that supreme essence, the divine soul of all beings, which withdraws his energy, and placidly slumbers. Manu adds—"Let him not wish for death, let him not wish for life; let him expect his appointed time, as a hired servant expects his wages."

All organised substances thus hasten to decay, all things elevated fall, all compound bodies dis-

solve, and all that live must finally die; as a large and firm edifice, when it becomes old, falls into ruin, so the aged, sink into dissolution. The night once passed, never returns; the waters of Yamoona run to the sea; days and nights are passing away; the time of life appointed for all living, is constantly wasting, as the rays of the sun in the summer dry up the moisture of the earth. Man rejoices when the sun rises and when it sets, but is unconscious of the decay of his own body. He takes pleasure in the spring time, when all things appear to him young and new, but as the drop of dew trembles upon the lotus, so is the happiness of man ever vacillating and ready to disappear; and, as on the bosom of the great ocean, one floating billow meets another, so do beings on this earth encounter each other for a moment Grieve for thyself! why shouldest thou grieve for others? Death always accompanies us; death ends our course; wrinkles are already on the body; grey hairs cover the head; decrepitude seizes on man; as pieces of drift-wood, meeting on the ocean, continue together but a little space; thus wives, children, relations, and wealth separate; no one living can escape the common lot: He who mourns his departed relatives has no power to cause them to return. The end of life,

is like a cataract rushing down with irresistible impetuosity, and every mind ought to pursue that which is connected with its own happiness and virtue. *

CHAPTER VII.

MATERIA MEDICA.

The study of natural history was carefully attended to by the ancient Hindu sages, and their medicines were derived from the vegetable, animal, and mineral kingdoms. From the vegetable kingdom, the properties of 760 medicines are described by Susruta. The metals are fewer in number; while those from the animal kingdom are numerous. These observers have recorded many properties and remarks on the choice of medicines, the situation in which they are best procured, and the period of their growth at which they possess their distinctive properties in the highest degree, with the manner of preparing and preserving them.

* Ramayana, the oldest epic poem extant.

SECTION I.

SIMPLE MEDICINES FROM THE VEGETABLE KINGDOM.

The Asiatic belief of there being a remedy for each disease, led the Brahmins to make a very careful examination of the vegetable kingdom; and a number of medicines were discovered, some of which were powerful, and many inert and useless. The success which followed the employment of these remedies in the cure of disease, was supposed to rest a good deal upon individual sanctity, and the divine pleasure that imparted it. This explains the great difficulty of obtaining information, as it was believed that if such secrets were revealed to others, the medicine would lose its effects, not only in the hands of the person to whom its qualities had been revealed, but also to the person who had known them before. There are nine such secrets which should not be revealed to any one :—the age of a person; his health; family occurrences; bad actions, and those which reflect shame, or dishonour upon him; his prayers to his tutelar gods; his charities; and the virtues of nostrums, the ingredients of which are known to him. It is from such pretended selfish motives that the properties of many valuable medicines have been lost to science.

The simple vegetable medicines are procured from the bark, roots, leaves, flowers, fruit, seeds, juices, gums, and wood of plants. These medicines are obtained from trees which contain fruits without flowers; from those which contain both flowers and fruit; from creepers which flower in clusters; and from plants which die after the ripening of their fruit, as rice, &c.

The effects of medicines from the vegetable kingdom will vary with the period at which they are gathered, according as this takes place in windy or calm weather, in sunshine or in the shade, during the day or night, in cold or hot weather, in a dry or rainy season, and according to the interval which elapses from the time of gathering the medicine, till it is used.

Medicines from this kingdom should not be procured either from a jungly country, or from one covered with water; neither from a dry and sandy ground, nor from one that is unequal, or has many holes, stones, or broken vessels upon it. Situations in any way broken up by insects, or containing the nests of white ants, which are supposed to remove the strength of the earth; or where water drops from a thatched roof; where bodies have been burnt or buried; where persons have died, or places which are regarded as sacred,

are not proper for raising medicinal plants. Ground in which there is much salt is also unfavorable for the growth of medicines; and plants that grow at unseasonable times, or are very old, and those which water forms, or insects have injured, are to be thrown away. Medicines should be procured from a fruitful country, where the soil is soft and moist, of a black, yellow, or red colour, of an equable weight, situated near water, where trees grow luxuriantly. In such situations the soil has its proper quality of taste, the place is sweet, and the plants are glistening. The qualities of fire are greatest when the soil has several colours, and where the earth is light, the trees small, and growing at a distance from each other, and where the young leaves of grass, as they burst through the earth, are of a light yellow colour. The qualities of wind predominate in dry places, of a grayish colour, like the ashes of wood. In such situations the earth is light, the trees are few, small, dry, and have holes in them, with little juice. The qualities of ether (akash) are in excess in such situations as are of a greenish colour, are soft in the centre and equal, with many holes. The water in such places is without taste, and the mountains and trees are large.

The rays of the sun and moon produce the

colour, &c., of plants. Thus the yellow colour of trees is produced by the sun, and these medicines should be gathered during the hot period of the day. Emetics are to be collected at such times, from a soil possessing the qualities of ether and wind. The influence of the moon is supposed to produce cold and white plants, which should be gathered during the cold season, when the qualities of these plants will be most energetic. They will then be sweet, moist like oil, and cold like water. Purgatives are thus to be gathered in a soil possessing the qualities of taste and smell.

The physician should observe the lucky days and hours, and the most favourable period of the moon's age, in order to ensure the cure of the disease. The stars which are predominant on particular days are to be observed, particularly those which occur on odd days. Medicines which are to be exhibited internally, are to be taken for the first time on Mondays, Thursdays, and Fridays. They are also to observe the most favourable period of the moon's age, and when fortunate stars are in the ascendant.

SECTION II.

SIMPLE MEDICINES DERIVED FROM THE ANIMAL KINGDOM.

These are so numerous that I shall not attempt to enumerate them; they embrace the skin, hair, nails, blood, flesh, bones, fat, marrow, bile, milk, and dejections; which should be obtained from healthy animals, which are neither very old nor very young. The urine and other dejections should be obtained from the female.

1. *Skin, nails, and hair*, are used for fumigations in intermittent fevers, &c.

2. *Blood.* When there has been a great loss of blood, it is sometimes exhibited internally.

3. *Flesh* is mixed with oily and other medicines, and vegetables; and is given in weakness, phthisis, and in nervous diseases.

4. *Bones.* The ashes of bones, mixed with other medicines, are exhibited in nervous diseases and those of children. They are also used to fumigate.

5. *Oils and Fats* are used principally externally, as in the form of ointment, &c.

6. *Marrow* is used externally in the form of ointment, and internally in cases of weakness.

7. *Bile* is considered a stimulant, and is used in fever; also as an external application to the eyes.

8. *Milk* is one of the principal articles of food. It is used in combination with decoctions, and given internally in diseases of children, and for nervous diseases. It is often used with oil as an external application.

9. *Urine* is pungent and slightly bitterish and saltish to the taste. It is slightly laxative, and cures diseases of phlegm and wind, and diseases produced by worms or from poison. It is also of use in leprosy, and in dropsical swellings, jaundice, and dyspepsia. Cow's urine is generally preferred.

10. *Dung*. The moisture contained in cow's dung is used in inflammation, and in discolourations of the skin. It is also given internally, and prepared with other medicines.

11. Honey, lac, eggs, cantharides, and leeches, are likewise used in medicine.

SECTION III.

SIMPLE MEDICINES DERIVED FROM THE MINERAL KINGDOM.

The Hindus appear to have been the first who employed mineral drugs internally. Their chemical skill was peculiar and remarkable. They knew how to prepare sulphuric, nitric, and muriatic acids,

which proves that the science of chemistry originated with, or was known to the Hindus, previous to its being cultivated by the Arabs. The former pursued its study, in order to prepare medicines; while the aim of the latter was chiefly directed to the vain search for the means of converting the baser into the nobler metals, and for the discovery of an elixer to cure disease and lengthen life to an indefinite term. Mineral medicines consist of salts, precious stones, poisons, and metals.

1. *Salts.* There are four kinds of salts used in medicine: saltpetre, natron, black salt, and borax.

Common sea salt is stomachic, and cures wind and indigestion. It is weaker than black salt. Natron, or impure carbonate of soda, is employed with advantage in dyspepsia, cholic, and enlargement of the spleen.

These salts promote appetite, and when their use is too long continued, produce diseases of the blood and bile. They cure swellings, piles, dysentery, and stone.

Sal ammoniac is purified by being mixed with lime-water, and exposed to heat in a leathern bag. It then forms a solution of ammonia; which is employed by itself, and along with other medicines.

Sulphur is purified by being exposed to heat in an iron vessel; and is used in medicine, mixed

with lime, oil, or rice-water, and in combination with other medicines. A particular form is reduced to powder, saturated with lime-juice, and used as a medicine in chronic diarrhœa and dysentery, and in combination with other medicines.

2. Certain precious stones and earthy minerals are supposed to possess superior qualities, as tonics and corroborants. The *diamond* is the chief of these, of which they distinguish four varieties—the white, yellow, red, and black. They also distinguish the large, soft, round, and bright, without inequalities and cracks, as the best, for use as a medicine. For this purpose, it is covered with a coating of clay and cow-dung, and is exposed for a day and a-half to heat, it is then soaked in the urine of a horse, and is so treated seven times, when it is considered fit for use. It improves the strength and colour of the body, and cures many diseases. *Pearls*, *corals*, and other precious stones, are prepared by mixing them with lemon-juice for a day, boiling them in the juice of the three varieties of myrobalans, and exposing them to heat, covered with a coating of clay and cow-dung (see fig. 6), when they are ready for use. They are considered good tonics, and cure many diseases.

3. A chapter will afterwards be occupied in the description of mineral poisons and their antidotes.

4. The *metals* which were employed by the ancient Hindu physicians were mercury, gold, silver, copper, lead, tin, zinc, and antimony, carbonate of iron and arsenic. (Susruta.) These were usually exhibited in combination with other drugs.

Mercury (siniab, páradá) is employed for the cure of disease, either in its metallic state, as found in Nepal, or in the form of Cinnabar, in Tibet. It is used in both forms for the cure of disease. The preparations of quicksilver with zinc, antimony, and arsenic, were probably introduced into Hindoostan several hundred years ago. It is also found mixed with black lead, stone, tin, and other impurities. When not purified by means of fire, it is dissipated in vapours by exposure to heat.

Good quicksilver is of a bright metallic lustre, and of a slightly bluish colour, like water, internally and externally. In all cases, it has a brownish and whitish colour.

To purify quicksilver from lead, mix it in rice water, and expose it to fire, which will dissipate the bad ingredients. To purify it from *tin*, mix it with the powder of Vishál (cucumis colocynthis) and ankotha (alangium hexapetalum) and expose it to fire. To purify quicksilver from other impurities, add the juice of cassia fistula,

and when in globules, mix it with the juice of datura and lime, and then expose it to heat. To destroy any poisonous substances, the three varieties of myrobalans are mixed with it, and exposed to heat. When given internally, it may be mixed with black and long pepper, and dry ginger.

To purify mercury to render it fit for being used as medicine, take of turmeric, brick-dust, suet, the juice of lemons (or sour rice water, if limes are not procurable), and the wool of sheep, of each one chatàk, and mix it with one seer of quicksilver. The mixture is to be well rubbed in a mortar, for one day, and the product carefully washed with water, and acidulated with fermented rice water.

Another means of purifying mercury is to place it in a bag, which is then to be immersed in rice water, and exposed to heat. This is called a dolàjantra, (see fig 1). By this means the quicksilver is completely purified.

Another way of purifying mercury is by sublimation. The apparatus is called *Urddhwapátanajantra;* and is used is this manner. Take vermilion and the juice of lemons; dry them in the sun, and then sublime. It is then to be rubbed with more of the lime, or the juice of the Pàribhadra (the coral tree or Erythrina fulgens)

and nimba (Melia azadirachta). They are to be mixed for three hours and again sublimed. See fig 2.

Quicksilver is also purified by evaporation, by means of Vakajantra, or a retort of this form. See fig 3.

Before quicksilver is mixed with sulphur, the following prayer is to be offered up: "O Vishnu, may you so order that this preparation may be so made as to enable it to cure all diseases." When such a prayer is offered up with faith, by a holy Brahmin, it will be granted. Then mix six parts of sulphur with one of quicksilver, put them in a crucible (fig 4*) with its opening properly luted; place this in a sand bath, (see fig. 5) and apply heat slowly. When the mixture is completed, take the crucible off the fire and break it; the contents may then be used for medicine.

There are four forms in which quicksilver is used in medicine; the black, white, yellow, and red forms.

The black kind (Aethiops mineral), is formed by rubbing together equal parts of sulphur and quicksilver over the fire, when the residue will

* The crucible is made by mixing two parts of the ashes of paddy, one of the nest earth of white ants, one part of iron cinders, one part of chalk and one part of hair; mix with goat's milk, and beat half a day. The crucible is then formed, and dried in the sun or fire, for use.

assume this colour, which is the common form in which mercury is used externally in fumigation.

To form white mercury, take of mercury, borax, honey, lac, and the wool of sheep; mix, and add the juice of the Bhringaraja (Verbesena scandens); then add sulphur, and mix for one day; after which expose it to the gentle heat of a sand bath until it is reduced to a dry powder. It will be white, like pure camphor. Another kind of white mercury is made by mixing turmerick, brick-dust, suet, amalaki (phyllanthus emblica, or emblica myrobalan), boira (beleric myrobalan), and haritaki (chebulic myrobalan), with mercury, treacle, congee, and the juice of the ghritakumari, or Indian aloes; mix for one day, and then add half the weight of prepared sulphur, and sublime. Another process is given for making a kind of calomel, as well as of corrosive sublimate; by mixing quicksilver with fused sulphur in equal quantities, forming a sulpheret. This is to be put in an earthen vessel, over which a layer of common salt, in a vessel half filled with rough brick-dust, and another vessel is to be luted over it. The mixture is then to be exposed for a day to the action of fire, when the mercury is white and prepared for use.—(Ainslie, Fleming, and Royle.)

The utility of this white form of mercury is very great. Combined with pepper and aromatics, it cures rheumatism, and the eighty diseases of wind, as well as the diseases of bile and phlegm. Should it affect the gums, a gargle of curdled milk should be employed. This preparation of mercury will also be found useful in colic, in fistula in ano, in diseases of the eye, in diseases of the arms, and in general debility; as it increases strength, appetite, and the general colour of the body.

The yellow preparations of mercury are made in the following manner. Mix equal parts of sulphur, quicksilver, and the hasti shundi plant, and the three myrobalans. Dry the mixture, put it in a sand-bath, and apply heat for twenty-four hours. When properly prepared it has a yellow colour. This preparation improves the health, cures dropsy, dyspepsia, and intermittent fevers.

Red factitious cinnabar, or red sulphuret of mercury, when in powder called vermilion, is prepared as follows: mix one pala of quicksilver, three palas of sulphur, and one of black lead with the juice of the ghritakumari tree; place the mixture in a clean vessel, put a lute, or coating of mud and cloth, or a mixture of lime and chalk, over it. It

is to be exposed in a sand bath for three days, when it will be found of a red colour. This preparation is said to cure all diseases, even of the fatal kind. It removes weakness, improves the appetite and memory, diminishes fat, and cures leprosy. It requires to be given in a proper menstruum and mixed with other medicines. The dose is one gunja.

Another form of mercury is prepared by mixing the black preparation in an iron spoon, with a little ghee, and then exposing it to heat. When melted throw it into a leaf of the plantain, which is to be pressed above and below by cow-dung, made into the form of a bag; it is then called Rasaparpati, or cake mercury, and is very useful in dropsy, in chronic dysentery, and as an alterative.

2. Gold, like other metals intended for medicinal purposes, was first reduced by hammering to small thin plates. These were exposed to a red heat, and in this state cooled first in oil, then in curdled milk, cow's urine, tea-water, and a decoction of kulattka (a kind of pea). Some physicians quench the gold three times, and others seven times in each liquid. It is also recommended that metals intended for medicines should be cooled twelve times in a mixture of the juice of the leaves of the tuttha and akander trees, with brimstone. Other

mixtures are recommended by different authors for oxidising metals.

The preparations of gold are considered as most valuable medicines, curing nearly all diseases, even those in which other medicines have been used without any good result. The general effect of these preparations is to increase memory, and restore the vigour of manhood, improve the natural colour of the body, retain the proper equilibrium of the different internal parts of the body; and so lengthen vision and prolong life.

The usual manner of preparing gold for use is to mix sixteen times the quantity of the gold plates to one of lead, and add lemon juice and *ghritacumari*, or Indian aloes. They are to be rubbed together, exposed to heat, and made into boluses of the usual size. Or take of the mass of gold plates, mix with quicksilver and sulphur, add a little water, or the juice of *ghritacumari*, make it into a large mass; put it in an earthen pot, with a mouth well secured, surround the vessel with a mixture of clay and cow-dung, and expose it to the sun to dry. It is thus to be exposed to the fire twelve different times, until it is reduced to powder. Some practitioners mix lead, sulphur, and quicksilver together with the gold, and the mixture is then prepared as above.

The gold thus prepared is often mixed with other metals, and is considered a valuable medicine in chronic diseases, in intermittent fevers, in gonorrhœa, and in diseases of the spleen. It is considered an excellent tonic, improving vision, and reducing the bulk of the body, and is good for consumption, and for pregnant women and children. It is useful in diseases of wind, bile, and phlegm.

3. *Silver.* This metal is prepared by mixing two parts of it reduced to small thin plates, with one of brimstone, and one of the sulphuret of arsenic (puntal). These are to be well mixed, lemon juice is to be added, and the whole surrounded by a mixture of cow dung and clay, and exposed to a high degree of heat in a furnace, in the same manner as that in which gold was stated to be prepared. This preparation is sweetish, sour, cooling and astringent; and it cures deranged wind, promotes appetite, strength, digestion, and the colour of the skin. It also lengthens life, and is of much use in all chronic diseases, as it purifies the body and the dejections.

4. *Copper.* This metal is found in the north of India. It is purified by boiling for three days with a strong heat, the small thin plates in cow's urine. The metal is then to be mixed with two parts of brimstone and one part of rock salt, to

which the juice of the lemon has been added. The mixture is then to be surrounded with a coating of cow's dung and clay, and exposed to the fire of a furnace, when it is ready for use. To prevent its producing vomiting and purging, put the mixture into a bulbous root called *surana*, (arum colocanim), which has been hollowed out: it is then to be covered with a mixture of dung and clay, and exposed to heat.

The sulphate of copper (Tuthaka) is prepared by mixing two parts of the thin plates with one of sulphur. It is then to be exposed to heat, with free exposure to the air, for two hours. This medicine will neither produce giddiness, vomiting, nor purging. These preparations of copper are found useful in fevers, particularly the intermittent kinds, diarrhœa, and diseases of the liver, spleen, and blood. They are also useful in leprosy, colic, piles, acidity of the stomach, dyspepsia, and rheumatism.*

5. *Lead.* This metal is found in many parts of Hindustan, and is used in the form of the carbonate, the red oxide, and litharge, and is prepared for use by mixing it with the juice of the *ákanda* tree. It should remain immersed for three days; then wash the metal in water, and mix it with the

* This last preparation is also used for strengthening the teeth, and for cleaning and improving their colour.

juice of the leaves of the vásaka tree (Justicia ganderussa) and sulphur. Put it into an earthen vessel, and expose it to a high degree of heat. It is then ready for use, and is recommended in gonorrhœa, in chronic diarrhœa, in worms, in leprosy and in ulcers.

The red oxide of Lead (*Sindura* s. *Sindar* H.) was likewise known, and sometimes used as a medicine.

6. *Tin.* The Hindus knew the oxide of Tin. One part was mixed with the same quantity of sulphur, to which the milk of the arka tree (calotropis gigantea), and the dry bark of the banian tree was added. The mixture was rubbed together in a hot mortar for many days. It was then prepared for use, and was bitter and sour to the taste. It diminished fat and the diseases of phlegm, was an Anthelmintic, and cured gonorrhœa and jaundice. It was to be avoided in diseases of wind.

7. *Zinc.* The Hindus employed an oxide and sulphate of Zinc. This and other metals are prepared in the same way as copper, and their effects upon the system are the same.

8. *Sulphuret of Antimony* was generally obtained from Nepaul or Siam; and was used at a very early period. It is prepared for use by placing it

in lemon juice, or lime water, and exposing it for several hours to the sun. It is exhibited in diseases of the eye, in the form of a collyrium, mixed with the juice of the ripe pomegranate. It is applied to the edges of the eyelid to increase the brilliancy of the organ; and is also used as an emetic in the first stage of fever, and in combination with other medicines.

9. *Iron* (Lauha). Is found in many parts of Hindustan in the form of oxide, in ochres, bog ores, and other friable earthy substances. The two following forms of ores are commonly used by the Hindus as medicines :—

Sulphate of Iron. This is prepared for use by macerating it in a decoction of the leaves of hemp. It is bitter to the taste; and is useful in epilepsy, in white leprosy, in diseases of the eyes, in diabetes, in amenorrhœa, and in phthisis. It is considered tonic, diuretic, emmenagogue, and anthelmintic. An *Iron Oxide*, containing chloride of iron, is prepared by mixing two parts of sulphate of iron with one part of rock-salt, and with lemon juice, in an iron vessel. Apply heat, and rub it with an iron pestle, until it becomes of a fine red colour. It is then slightly bitter and sweet; and is of use in gonorrhœa, in diseases of the urine, in worms, and in various diseases of the bile and phlegm. It is usually

exhibited in combination with other medicines for improving the strength.

Hydrated Oxide of Iron (Mandura and Sinhama.) When iron has been exposed for many years in the earth it is changed to a red colour, easily powdered. It is used for the same diseases as the other preparations of iron.

There are other varieties of iron. The Kanta (magnetic oxide?) is the best, and is prepared as follows:—The iron must be in thin small plates—expose it to heat, and quench it in the juice of the plantain tree. Repeat this seven times: make a furnace by digging a hole one cubit in depth, and the same in circumference—fill it with live charcoal, mix the iron with half its weight of (Swind Maaker) the common pyritic iron ore, mix them in the juice of the three myrobalans, add one fourth of red arsenic (Manahshila), rub them together with sour rice water—expose them to heat in the usual manner in a blast furnace, which is to be well covered; remove the iron when in a red hot state, and quench it in a mixture of the three myrobalans —beat on an anvil to separate the oxidized part. Again expose the iron as before, so as to reduce all the iron to this oxide, which is used by rubbing it up with cow's urine; making it into small boluses, putting them in an earthen vessel, and exposing the

mixture to the heat of a fire of cow's dung. Repeat this a number of times—from 10 to 1000.—It should never be used unless prepared by exposure to heat more than ten times at least, and it will be so much the better if this be repeated many more times. In this state it does not sink in water, and there is no alterative so good as this. It is an excellent tonic, improves digestion, and removes all diseases and weakness.

10. *Arsenic.*—The *yellow* sulphuret of *Arsenic* or *yellow Orpiment* (Haritala) is brought to India from China and the Burman dominions; is purified by boiling it in the water of a kind of gonaro Kushmanda, in lime water, in oil, and in sour rice water, for two or three hours in each. Both the sulphuret of arsenic, and arsenious acid, were employed by the Hindus at a very early period.* This medicine is also purified by mixing it with four parts of nitre, and then subliming it. This is done by placing it in an earthen pot with another over it, and applying heat for a day and a night. This is a very celebrated medicine in black leprosy, in cutaneous affections, and in fever. It also improves the colour of the body, and cures mania, &c.

Red Arsenic or *red Orpiment* (Manahshila) is brought from Japan, and is prepared by macerat-

* Susruta, pp. 85 and 95.

ing it in the juice of the boke tree, or in the juice of fresh ginger. It is tonic, and is used for removing diseases of phlegm, for asthma, &c.

White oxide of *Arsenic* (Daarmuch) is purified by being macerated in the juice of the lemon, and then boiled in the juice of the plantain tree. It is used in doses of the fourteenth part of a grain, in conjunction with aromatics, to check obstinate intermittent fevers, and in glandular and leprous affections, in the same way as the yellow arsenic.

CHAPTER VIII.

PHARMACY.

The preparation of medicine may be explained by describing the weights and measures, the preparations, forms, administration, and uses of medicines.

SECTION I.

WEIGHTS AND MEASURES.

These are often indefinite among the Asiatics, from want of a fixed standard, and from their

employing seeds, which vary considerably in the weight. They have been reduced to a more exact arrangement by Madopokera, a modern author.

The smaller weights are rarely used in practice, from medicines not being usually given in a concentrated form. They were arranged with that affectation of minuteness and accuracy peculiar to the Asiatic, as follows:—Eight of the particles of dust seen floating in the sun's rays, as they enter through a lattice, formed one likhya, and were supposed equal to one minute poppy-seed; and three of these were equal to a black mustard-seed; three of which were equal to one white mustard-seed; and six of these sershapa were equal to a yava, or middle-sized barley-corn; three of which again were equal to a rattah, or a seed of the gunja creeper, (the arbutus precatorius). This is considered equal to four grains of rice in the husk, or two large barley-corns, and is the common medium of comparison for other weights. The fictitious ratticà in common use, is double the weight of the gunja seed, or something less than $1\frac{3}{16}$ grains. This is the lowest denomination in common use.*

Physicians of Hindustan often use the following weights:—one soorkh, equal to 1 grain; one masha, equal to 8 soorkhs, (or gr. viii); one direm,

* Colebrooke's Asiatic Researches, vol. v. p. 91.

equal to 3 mashas, (grs. xxiv.); 1 tola, equal to 12½ mashas; and 2 tolas = a karsha or aksha.* Susruta allows five rettahs to one masha, in forming pills, extracts, and powders. Eight tolas are equal to two shukte, or one powales, or handful (mushti;) and four powales, equal to one kudavas or half-a-seer.

The fluid measure consists of a pot made of bamboo, wood, or iron, called *kudava;* a measure of capacity, the sixth part of a maund, and the fourth of a *prastha,* or a vessel four inches in diameter, and as many deep.

Double the weight of dry medicines should be used, until the weight exceed a kudava, or 32 tolas, when the dose in both should be the same. When vegetable juices are very strong, half the dose of the dry medicine should be given; but in general with the list of medicines in MSS., the dose of each is given.

The modern Bengalee physician, (cabarage) consider the tola, or one sicca rupee weight, the unit of his ponderary system. It weighs 180 grains English troy weight:—

8 tolas = 1 pala; 2 palas = 1 prassitis or handful; 5 tolas = 1 chatack; 4 chatacks = 1

* A tola in the ancient Sanscrit MSS. is equal to half a tola of the modern medical weights.

powahs; 4 powahs = 1 seer; and 40 seers = 1 maund.

SECTION II.

PREPARATION OF MEDICINES.

In the medical works of the Hindus, pharmacy, or the preparation of medicines, is treated of in four books, stated to have been derived from the gods. It was on this account that a prayer was offered up in collecting, in preparing, and in exhibiting remedies.

The Hindus employed iron or stone mortars, which were used cold, or heated by exposure to a fire made of the dry litter of goats, or the husks of rice. The pestle was either of iron or earthenware; of sufficient size to hold by the hand. Care was taken that both were perfectly clean when used.

Medicines should be prepared in a good house, and in a retired situation. If prepared in open situations, in boats, in bazaars, and by the side of roads, their qualities are likely to be injured by unfavourable influences. Should a bad woman, or one menstruating, touch a medicine, it will lose its qualities. Medicines given in too small doses

will be like a little water thrown upon a large fire, which rather increases than diminishes it. In like manner, too large doses of medicine will increase the disease, or will produce other diseases.

SECTION III.

FORM OF MEDICINES.

Internal medicines are usually employed by medical practitioners in the form of powders, the juice of plants, pastes, infusions, decoctions, extracts, roasted medicines, tinctures, pills, electuaries, medicines that are sucked, and oils.

1. *Powders.* In preparing such medicines, dry them in the sun, or over the fire, powder them in a mortar, and clean the powder by passing it through a sieve. They are used when green herbs cannot be procured.

The usual dose of such is from one masha to half a tola, and it is administered in water. Powders are usually employed in diarrhœa and dysentery, and as purgatives, emetics, &c.

2. The fresh juice of plants is a frequent form of exhibiting medicines. The juice is generally got from the leaves, and is prepared by boiling and then straining.

3. *Pastes* are made by grinding the medicine between two stones.

4. *Infusions and Decoctions, &c.* The former are prepared by mixing one part of green or soft medicines, with four parts of boiling water. The herb should always be pressed a little before being infused. When the medicine is hard, eight parts of water, and when very hard, sixteen times the quantity of water are to be used. The infusion should be continued until reduced to one-fourth.

Milk, gruel, and whey are boiled with four times the quantity of water, till one-fifth remains. In preparing cow's urine and buttermilk, eight times the quantity of water should be used, and boiled down to one-fifth.

A weak decoction is frequently administered as a drink to check thirst, and it affords marked relief; such is the following:—take of musta, (cyperus rotundus), parpataka, (oldenlandia biflora), chandana, (sandal wood), kuskus, (cuscus grass), bála shunthi, (dry ginger), of each an equal quantity. Two tolas of this are to be mixed with two seers of water, and boiled down to one seer; dose, a chatak occasionally.

For preparing decoctions, take two tolas of the medicine to half a seer of water, or one part to sixteen parts of water, and boil down to one

quarter; strain, and take this quantity twice a-day. Some recommend eight parts of water to one of the medicine, which are to be boiled down to one quarter. These decoctions are made fresh as required, and a little honey is usually added. Weak decoctions are prepared by adding two tolas to two seers of water, which are to be boiled down to one half the quantity. These are to be taken several times a-day. Sometimes medicinal powders are added to the decoction; and in other cases, the medicine is recommended to be prepared for use by maceration for a night in cold water. The water is then strained for use.

The fresh juice of plants is considered the strongest form of medicine; the decoction is next, and those obtained by maceration and by infusion are the weakest.

5. *Extracts.* Make a decoction of the medicine in water, boil for a certain time, strain through linen, and again boil it down to a proper consistence, or until it becomes thick, when a small portion thrown into water does not mix for some time, or swims in the water; or when a piece of it sticks upon a vertical board, when thrown upon it: the extract is then prepared. Too much boiling should be avoided, as by this means the medicine loses its peculiar qualities. A form named

Bhavana is made by reducing the medicine to powder, mixing it with a decoction of the same drug, and then exposing it, from time to time, to the influence of the sun, for seven days.

6. *Roasted medicines.* These medicines are prepared by crushing them between two stones, with the addition of water. When in a state of pulp, wrap them in the leaves of the blackberry, or Indian fig-tree, tie them tight with a string, and cover them with a coating of clay and cow-dung one finger breadth thick. They are then to be exposed to the fire of cow-dung until the clay is red hot; and are then ready for use, and may be exhibited in the form of powder or pill.

7. *Tinctures* or Wines are often recommended by writers on medicine.

8. *Pills* are prepared in different ways; some are made by rubbing the medicine betwcen stones, others by macerating or grinding them to powder, which is then to be mixed with water or syrup, and placed in an open place at night. Other pills are formed by boiling, and allowing the mixture to stand in the air, or in the sun, and then forming the mass into balls or pills. Each should weigh from one half to one quarter of a tolà. There are different names and measures for preparing them, according to the nature of the medicine, and the manner in which they are used.

9. *Electuaries.* These preparations are made by boiling down the decoction of the medicine to one quarter, and mixing sugar with it; again boiling for some minutes, and when it has arrived at the consistence of congealing quickly, on being removed from the fire, adding the prescribed powders.

Medicines to be sucked. These medicines are made with syrups, powders, and other drugs. They are very useful in curing dysentery, cough, hœmoptysis, &c., being more readily absorbed.

10. *Oils.* Oils are usually prepared by mixing them with four times the quantity of milk, whey, cow's urine, &c.; boiling to get rid of the watery part, then adding certain fragrant medicines, and straining through cloth. Sometimes a certain quantity of mustard oil, with the fresh juice of certain herbs, and other spices, previously pounded in a mortar, are to be added, and the whole boiled. These oils are used as external applications. Several such preparations of oils are used, as errhines. Considerable experience is required in boiling the oils; as if too little or too much boiled, they will not produce the desired quality.

Ghee is prepared by simmering buffalo's-butter over a gentle fire, for a few minutes, and cooling gradually. Butter is considered crude and unwholesome compared with ghee, without the

addition of the oderiferous medicine. It does not produce froth as oil does, and it is known to be ready when the sediment which remains in the vessel is soft like wax, is easily twisted, and does not burn with a noise, when a small piece is thrown upon the fire.

Oil, *ghee*, and *jagry*, should be prepared in one day, as the different ingredients will retain different qualities, and not possess the proper uniform quality. Medicines that contain oil, ghee, or jagry, extracts, and pills, become useless after a year. The qualities of boiled ghee are improved by keeping; whereas, raw oil becomes rancid after two months. Fresh drugs, in general, lose their properties after one year; some powders are weakened, or are rendered useless, after being kept for three months; other medicines, made from coral, pearl, ruby, shells, &c., do not lose their qualities for many years.

These were the most ancient forms in which vegetable medicines were employed. In the course of time, other preparations and forms of medicine were added to those obtained from the vegetable, mineral, and animal kingdoms. The latter class were usually applied externally.

SECTION IV.

ADMINISTRATION OF MEDICINE.

It is incorrectly supposed that chemistry was first studied by the Arabs, as the ancient Hindus employed many useful chemical preparations for the restoration of health, and for the purposes of the arts. Even the transmutation of metals, or alchemy, was first studied by the ancient Hindus, and was afterwards pursued with assiduity by the Arabs.

Medicines are either exhibited externally or internally. The former method will be described in the chapter on surgery; and the qualities of the internal medicines are modified by exhibiting them in the pharmaceutical forms of infusions, decoctions, extracts, oils, electuaries, pills and boluses, extracts, tinctures, ointments, plasters, &c. Hindu practitioners combined numerous ingredients, which were often administered for the cure of a disease without much reference to the circumstances of the case, their comparative efficacy in particular diseases, or the stages or modifications of disease, in which they were to be employed. Some of the simple medicines were

powerful, and too little appreciated, and their dose not properly defined. In most cases the medicines, whether potent or inert, were directed to be employed in equal proportions. Many of these internal medicines were stimulants, such as the infusion of pepper, &c., and were used with the intention of increasing the bodily strength when in health, as well as of removing disease when present. The peculiar properties of medicine were supposed to be increased by multiplying the ingredients. For this reason the articles of the materia medica were administered in combination, and their receipts were often carefully preserved, and handed down in families as specifics for curing particular diseases. It was this opinion that led practitioners, at an early period, to investigate the nature of medicines, and their action on each other; and they early discovered the stages of the vinous and acetous fermentations.

All kinds of medicines are said to be best when recent, with the exception of honey, ghee, ginger, long-pepper, and cumin seed. These substances should be kept some time before they are used as medicines. All other fresh medicines should have their peculiar smell, which they slowly lose, and when they are a year old they are to be thrown away. Plants obtained from the Himalaya moun-

tains are the best, as their juice is usually the strongest. Cow-herds, hunters, &c., may be employed to collect medicinal plants; but a Brahmin should be preferred, particularly if he is poor, and has performed the necessary ablutions and prayers.

Medicines from the animal kingdom are to be taken from young and healthy subjects; and secretions, such as milk, urine, &c., are to be taken after the digestion of the food of the animal. The effect of these remedies is either to increase, diminish, or cure deranged wind, bile, and phlegm, or those of the essential parts of the body.

There is no medicine with one quality; so there is no disease in which there is one humour alone affected; medicines should therefore be mixed according to the state of the patient, the term, and the virulence of the disease. If a medicine consisting of one or two ingredients is not found useful, other ingredients should be mixed with it; and in other cases some of the ingredients should be removed from the prescription.

When no liquid is recommended with medicine, water, honey, sugar, or such substances as speedily act on the body should be the menstruum; when no part of the vegetable is stated, the root is to be used; and when no time is stated, the medicine

is intended to be taken in the morning. When wind is deranged, soothing and heating articles are to be mixed with the medicine; when phlegm is deranged, warm and dry articles; and for deranged bile, bitter and cooling substances are to be used.

In diseases of the chest, with difficult breathing, and the voice affected with cough, and ulcers of the throat or nose, the medicines must be changed for expectorant drugs, which are to be repeated frequently to keep up their action on the system. The food should be chicken broth and the like.

In some diseases milk is to be avoided, and in others it alone should be used after medicine. In some cases more rice than usual should be taken, and should be mixed with the medicine, when the pulse is strong and the internal heat active.

Should one medicine not have the desired effect in a few hours, another must be tried; but if a medicine has been of benefit in diminishing the disease, and not producing any unfavourable symptom, it should not be changed. When several well-selected medicines have been given in succession without any good effect, there is much fear of the result of the disease.

Care should always be taken that a second medicine is not given until the one previously

exhibited has been properly digested; and this is known when it acts in the usual manner, while the body feels cold and light, and with appetite, thirst, and occasional belching, and when the person is in good spirits and the senses are acute.

In all cases of disease in which medicines are required, the Hindu physician considers it necessary to follow a proper regimen, otherwise the remedies will not have the desired effect.

Before a medicine is administered to a sick person, the physician should examine the condition of the wind, bile, and phlegm; the internal heat; the patient's strength, sex, and age; the cause producing the disease; and, lastly, the ingredients of which the prescription is composed. He is next to note if the intestines have been cleared out; and after these circumstances have been duly considered the treatment is to be commenced.

The medicine must be varied by the temper, constitution, age, and disease of the person. Immediately after birth, an aperient should be given, as the infant will not be well until its bowels are opened. For children, the medicine may be mixed with honey, brown sugar, or the like, and placed over a small roll of cloth, which is to be sucked by the patient. An infant of a month old is to get one rattah of medicine in

a moist state, formed with honey, milk, sugar, ghee, &c. One rattah is to be added for each additional month, until one year old; up to the sixteenth year, one masha is to be given for a dose, and the medicine may be of a stronger nature, according to the severity of the disease. From the twenty-seventh year of age, strong and specific medicines are to be used; and an additional one each year, up to the seventieth. After this age, the doses of medicine are to be diminished to those fit for a boy of sixteen. When the patient is not very strong, two-thirds of a dose is to be given; and when very old or young, or very weak, only one-half of the dose is to be administered; above five years of age, syringing the nose with medicinal liquid is allowed; and above seven years, errhines are to be given; and above twelve years, fumigations may be used. In the months of October, November, January, and February, when the season is cold, medicines should be given at noon; in the four hot and moist months—May, June, July, and August, medicines should be administered in the evening and morning; and in the rains (September and October), when the climate is temperate and moist, medicines may be administered at any time.

They are not to be administered when the per-

son is much frightened, or extremely weak after vomiting or purging, after eating or drinking, fatigue, violent exercise, long fasting, or fever, when under the influence of great grief, and when the patient cannot sleep at night, when the food is not digested, when the body is very hot, and when it is affected with much thirst. It is also necessary to be careful to administer the proper dose of the medicine, which must be decided on by the tact and experience of the physician.

In administering medicine, the practitioner should recollect that a weak medicine will not cure a severe disease, as a fire cannot be quenched by a few drops of water. In like manner strong medicine, when given to cure slight diseases, will produce other evils, as the root of the sun-plant will die when heavy showers of rain continually fall upon it. Consequently medicine should be administered according to the severity of the disease, the state of the wind, bile, and phlegm, and the internal heat, the state of the alimentary canal, and the urinary secretions, the strength and age of the patient, the stage and nature of the sickness, and the kind of medicine as specified in the shastras. It is also very necessary in preparing medicine that the exact proportion of the different ingredients be observed; for if more or

less of any of the ingredients be used than specified, it will have a tendency to increase rather than cure the disease. If administered in ignorance, medicine resembles poison, the knife, and lightning, in its destructive effects; and even poison, if exhibited properly, will often resemble the water of life.

Should the sick person be strong, and have a severe disease, a full dose of the medicine may be given; of oil decoctions, and the like, one pala is the dose. To a moderately strong person with a less severe disease, three fourths of a dose are to be given, or three akshas or six tolas. Should the sick person be in a state of weak health, or be old, or an infant, half a dose should be given; or five rattahs, or one masha, whether it be made of oil, ghee, a decoction, or any other medicine. Of electuaries and syrups one or two karshas may be given, according to circumstances. The dose is afterwards to be increased or diminished according to the circumstances of the case, such as the frequency and consistence of the dejections, &c.

The body is to be prepared for medicine by rubbing oil on the surface, and giving some oleagnious mixture internally.

The time for administering medicines requires to be considered; as one requires to be given

before, others during, and a third kind after eating. The following precepts should be attended to in the administration of medicines :—

1. In short and acute diseases the medicine is to be taken on an empty stomach, that it may be sooner digested; like a drop of oil upon water, it is rapidly diffused over the system.

2. The medicine may be taken with advantage before eating, when the patient is strong and the disease severe.

3. One half of the medicine should be taken before, and another after food.

4. By the old and weak the medicine should be taken with the food.

5. By others after the food, when the disease has occurred suddenly, and when the patient suffers from asthma, cough, thirst, and vomiting.

6. Another kind should be taken with a covering over it.

7. When the disease is in the middle of the body, the medicine is to be taken between the two periods of eating.

8. Another kind of medicine should be taken with each morsel of food.

9. For asthma, cough, thirst, &c., an emetic should be occasionally administered.

The Hindu physicians suppose the efficacy of

medicines to be much increased by mixing a number together, and employing these prescriptions for the cure of particular diseases. The effects of simple drugs are neglected, and the peculiar circumstances of the patient are not always sufficiently attended to in practice.

SECTION V.

CLASSIFICATION AND USES OF DRUGS.

Charaka arranges drugs under forty-five heads, according to their action in removing classes of symptoms. The chief classes are those which are supposed to promote longevity, strength, and corpulency to the body; which make the body thin, as sudorifics, laxatives, and purgatives; those which produce and stop vomiting, enemata, errhines, sedatives, and anodynes, which give a relish for food, increase or diminish the internal fire, appetite, &c. Another class soften and improve the colour of the body, increase milk, purify and promote the secretion of semen, clear the throat, and quench the thirst; others cure certain diseases, as piles, swellings, dropsy, leprosy, itchi-

ness, hiccough, cough, asthma, and sooth colicky pains. The anthelmintics, astringents, diuretics, febrifuge remedies, and antidotes against poisons, are next considered; and the last class are medicines which equalise and purify the humours, diminish the burning of the body, shivering, fatigue, temporary swelling and redness. All these drugs are usually exhibited in the form of decoction. The great defect of such a classification of medicines is from their being intended to remove symptoms, rather than the cause, or the disease itself.

Susruta divides medicines into two classes, one of which increases strength, by evacuating bad humours from the body, as purgatives and emetics; and the other lowers the exalted action of the humours, and restores them to a healthy state. By another arrangement, medicines are classified according as they are supposed to cure wind, bile, and phlegm; and according to their action on certain organs, for the treatment of certain diseases, or classes of symptoms. Thirty-nine simple drugs are enumerated for curing diseased wind, twenty-three for curing diseased phlegm, and twenty for deranged bile.*

* See Commentary on the Hindu System of Medicine. Calcutta. page 137, &c.

Medicines may be usefully arranged, according to their actions, into diaphoretics, emetics, purgatives, pastes, enĕmata, errhines, diuretics, astringents, tonics, emollients, nutrients, maturants, &c. The Hindu physician, before any of these medicines were given, relaxed the body, by rubbing oil upon it externally, and giving some oleaginous mixture internally.

1. *Diaphoretics* were the application of heat; by the steam of hot water; by the application of certain warm poultices, or plasters, made of different medicines; and by fomentations, with various decoctions. For promoting perspiration, the body should be relaxed by the use of ghee, oil, fat, and marrow. Of these, ghee is the best, as it is produced from milk obtained from the cow. This milk first yields curdled milk, then butter, and with the assistance of fire, ghee is produced. Nothing else can be obtained from ghee, so that it may be considered as pure. For diseases of the bile, ghee only is to be given; of wind, ghee and salt, mixed; and for diseases of phlegm, ghee, long-pepper, pepper, dry ginger, and nitre, mixed together. A weak person, with a bad memory and digestion, should use ghee to strengthen them. In certain cutaneous diseases, for open boils and for worms, oil is useful, parti-

cularly when the phlegm is deranged. To fat people, particularly when the wind is deranged, and when the dejections are not natural, oil should first be given. Lard is most useful for external diseases, those of the joints, bones, and sensible parts.

Perspiration should not be promoted in the scrotum, throat, or eyes. When wind and phlegm are deranged, diaphoretic medicines that contain the qualities of coldness and heat respectively are to be used. When wind is deranged, cooling medicines alone are to be used; and when phlegm, only hot medicines are to be used. When wind and phlegm are deranged in a part, or when only wind or phlegm is deranged, perspiration is to be promoted in such places alone.

Perspiration is not to be encouraged in very fat, very thin, or debilitated persons, when affected with diseases of the blood or wind; when the diseases are incurable; in dysentery; or when the person is afflicted with large sores over the body (kotha). Nor will perspiration be proper after taking poisons, or drinking; or for the blind; when when the abdomen is swelled; or in erysipelas, or leprosy, or in a bad state of the blood. In such cases milk, ghee, curdled milk, and honey should be given after purgatives.

It is improper to give diaphoretics when the

body is burnt; in diseases of the anus; in grief, or fear-producing diseases; in passions, in hunger, in thirst, in weakness, in jaundice, in gonorrhœa, in hemoptysis, in pulmonary consumption, in dysentery, during the flow of the menses, or after taking much wine; in pregnancy, particularly near its termination; in diseases of wind, or in fatal diseases. When diaphoretics are used under such circumstances, they will do harm, or their peculiar favourable effects will not be produced.

After oleaginous and perspiring medicines have been exhibited, any of the other five varieties of medicines may be employed with advantage, according to the effect that is required to be produced.

2. *Emetics* and purgatives are supposed to be the most powerful medicines when the wind, bile, and phlegm are moderately diminished or deranged, and they restore the humours to their healthy state. In general, emetics are recommended when the stomach is surcharged with phlegm; and purgatives, when the intestines and bile are deranged.

When the practitioner has decided on the necessity of giving an emetic, the preliminary relaxing medicines, with honey and saindhava (an impure kind of salt), are to be exhibited.

This is usually done in the morning, or the day before the exhibition of the emetic; more particularly when the strength and internal heat of the person are great, and the humours much deranged. The patient should then drink freely of milk, whey, rice-water, or the like. The emetic should be given, and the warm hand applied frequently to the abdomen, for an hour, to soften it. If it cannot be taken in the usual way, by means of its taste, it may be sucked through the stalk of a hollow reed, so that it may pass down the throat. The emetic should be taken in the morning. The person is to place himself upon a stool, with his thigh parallel to the floor, and his head, back, and sides supported by friends. He will first feel sick, then saliva will flow from his mouth, and tears and mucus from his eyes and nose, followed by vomiting. The vomiting will be promoted by thrusting the finger, or the stalk of a lily, down the throat. The vomiting is to be encouraged until the stomach is completely emptied; this is known not to be the case by the discharge of the saliva, by the bad breath, and by the body being itchy.

Among emetics, *madana* fruit (spermacoce hispida) is the best, and may be administered in the form of powder or decoction, with honey and rock-salt. An emetic is sometimes prepared by

bruising and mixing long-pepper, Indian sesamum (teta), indrogobo, saindhava (impure salt), and the root of the moina tree (madana). The vangueria spinosa, asclepias germinata, azadirachta (the Indian species of mustard); bitter cucurbitacea, fossil-salt, and the sulphate of copper, mixed with several vegetable drugs, were employed mixed with honey, as an emetic, which was recommended to be used when poison has been taken.

The following emetics are to be used when the phlegm is deranged: white mustard-seed, rock-salt, and long pepper; repeat the dose frequently until the desired effect is produced. There are various emetics which are exhibited in the form of powder, or as a mixture, followed by warm water. The dose of the emetic should be varied with the strength of the individual.

When an emetic has acted properly it first produces an evacuation of phlegm and bile, without pain; and the breast, neck, and head feel clear after it, and the body light. The vomiting may be stopped by snuffing sweet-smelling mixtures up the nostrils. One kind of emetic acts as a purgative, another restores irregularities of the humours, (dhatu), and retains the body soft.

Vomiting should not be excited in cases of sparks being seen, or sudden blindness, or great

fatigue, in spleen disease, nor in jaundice, when the abdomen is swelled, for very fat or thin persons, for infants, for pregnant women, nor for very old persons, particularly when afflicted with piles, spleen sores, or diarrhœa, tetanus, hoarseness, hemoptysis, or after great losses of blood. When emetics act as purgatives, not as emetics, or when purgatives act as emetics it is unfavourable. The kind of emetic must be varied according as the wind, bile, or phlegm is deranged; and various diseases are supposed to be produced, when the emetic effect does not take place, such as sores in the mouth, fœtid breath, &c. In such cases the person is not to eat, and the emetic must not be repeated that day. If the emetic do not act freely, give warm water mixed with long-pepper. Should the vomiting be too severe, it may be repressed by anointing the body with ghee, by cold bathing, and by taking internally a decoction of raisins, with sugar and water, and other agreeable drinks. In the afternoon, a warm bath is to be given, and light and nourishing food, such as ground pulse of different kinds, with the broth of wild animals. An aperient is then to be given to act on the bowels, and food is to be taken in small quantities, to renovate the internal fire, and thus repress the vomiting.

Emetics are very useful in diseases of phlegm; in cases in which poison has been taken; in diseases accompanied with much thirst; in diseases of the internal heat, particularly when changeable; in diseases of the mammæ; in madness; in epilepsy; in elephantiasis; in diseases of the humours; in fevers; in want of appetite; in boils; in diseases of the stomach (ámáshay); in dysentery and bloody flux; in diseases of the chest; in large secretions of saliva; in sickness; in difficulty of breathing; when the person has lost his sense of smell and taste; in diseases of the lips and mouth, when pus is discharged; in diseases of the throat, &c.

A list of twenty-five emetics is given in the commentary, and these medicines act as emetics, errhines, &c., curing all the bad humours, from the stomach upwards. Sometimes they are used simply, more commonly in combination.

3. *Purgatives.* The day before a common purgative is exhibited, the patient is required to eat light food in combination with warm water, so as to remove any derangement of the phlegm. The next morning the body is anointed with oil, and exposed to heat, to promote perspiration, after which the purgative is administered, and is supposed to clear the body of diseased humours below the stomach. It is stated

that should this preparation not be attended to, the persons constitution will be injured. These purgatives should be varied according to the state of the bowels, and the purpose for which they are given.

First, when there is looseness with much bile, the medicine should be cool and in small quantities.

Secondly, when wind and phlegm are deranged with costiveness, the medicine acts with difficulty, and should be exhibited warm and strong.

Thirdly. There is a middle condition in which the bile, wind, and phlegm are affected, with the bowels neither constipated nor relaxed, in which case the medicine should be given of a temperate heat, and of moderate quantity and quality.

The dose of aperient medicine should vary with the age, &c. of the patient, and when a purgative has been administered, in the above form, its action should not be suddenly stopped. The patient should stay in a closed room, and he should not take cold water, nor use force in the evacuation. When the purgative has not produced the desired effect, it will cause derangement in the bile and phlegm. The body is hot, there is no appetite—and there is a heaviness in the belly, uneasiness in the breast, itchiness of the arms, and not a not a free evacuation of the urine.

When the purgatives act properly, the patient feels easy, happy, and light, and wind, phlegm and bile pass freely. After the action of purgatives, the patient should take thin and light food—as congee, and sometimes broths. If purgatives are taken from time to time in a proper form, they clear the understanding and senses, improve the strength of the organs, and of the body. They also improve the appetite and retain the humours in a healthy state, and retard the approach of age.

In infancy a mixture of honey, sugar and trivrit (teori or convolvulus turpethum) is to be given, in the form of a powder.

When purgatives act too powerfully, they produce fainting, frequent mucous stools, prolapsus ani, and pain in the belly.

When a purgative acts strongly with a discharge of blood, pour cold water upon the body, and give an emetic, with congee and honey; or give oily or mucilaginous liquids.

Purgatives should not be given during the beginning of fever; that is, while the patient feels a slight appetite, and his bowels are not very costive. For infants, and old or very fat people, purgatives are to be avoided; also, when the body is very hot or much fatigued; in bloody stools, and immediately after labour; also when

the appetite is bad, in derangements of the blood, bile and wind, when there are sores on the body, or internally, when there is great thirst, after loss of blood; and in diseases of the lungs. Should a quack give purgatives at an improper time he will kill the person.

Purgatives should be used in fevers, in diseases from poisons, in piles, in swelling of the glands, in jaundice, in epilepsy, in diseases of the heart, in fistula-in-ano, in vomiting, in diseases of the vagina, in colicky pains, in costiveness, and in cholera; in certain diseases of the belly (alasaka), in leprosy, in eruptions, in gonorrhœa, in the enlargement of the spleen, in hydrocele, in ophthalmia, and in general in diseases of the eye, especially in purulent ophthalmia; in diseases of the head, ear and nose, in those of the anus and penis, in worms, in diseases of the bile, involuntary discharges of semen, &c.

The discharges produced by purgatives are first, urine, fœces, bile, then the medicine, and lastly phlegm.

Of the purgatives the *Trivrit*, or as is it usually called teori (convolvulus turpethum), and Harítakí (chebulic myrobalan) are considered the best. Of the oily purgatives, the castor oil is the best. In diseases of wind, give teorí in powder (6 annas

weight for a dose) with the juice of the sugar cane, danti (croton polyandrum), ricinus communis, cassia fistula, purgative cucurbitaceæ, the seed of ipomœa cœrulea, myrobolans, the juice of euphorbia antiquorum; along with these sugar, fruits, &c., are used as laxatives and combined with warm aromatics, such as pepper, ginger, &c.

In diseases of the bile, the medicine is administered with milk; and in diseases of phlegm, the same medicine is given with the decoction of long and black pepper and dry ginger.

The covering of the Harítakí, is to be used like the teorí, in the same form and dose, and to cure the same diseases. Castor oil is prepared by gathering the seed at the proper season, drying it for seven days, and taking the kernels and boiling them in water—the oil is to be removed for use —in other cases the oil is got by pressing the seeds between weights. This oil is to be given to children from birth to the tenth year. It is also given to old and weak and delicate persons.

Purgatives may be prepared and exhibited with ghee, oil, milk, wine, cow's urine, broths, and certain forms of food. The action of purgative medicines will be increased by using warm water with some infusion, the warm or vapour bath, and friction with the warm hand. When

the laxative effect is not sufficient, it is not to be repeated till the next day; but when a sufficient effect has been produced the purgatives should not be repeated for ten days.

The internal fire is diminished by purgatives; and as soon as the action is produced, light food is to be given, and a little mango bark mixed with congee water is to be used internally, and externally friction, so as to increase the internal fire. The efforts of nature should not be resisted; but when the person is weak, and the bowels loose, the medicine is to be given in small quantities and frequently repeated. When the bowels are loose, and the patient either weak or strong, purgatives are to be given, and when in that state the bowels are not freely evacuated, the collection of the bad humours, if retained, will produce other diseases.

A small dose of the purgative should be first given, and when the individual's constitution is better known, a stronger one may be administered. The following are examples of purgative mixtures: take of Harítakí (yellow myrobalan), salt, and long pepper, in equal proportions, grind them into a paste with water; dose, three drams. Or, take of Harítakí (yellow myrobalan), amalaki, (emblic myrobalan), vibhitaki (beleric myrobalan)

in equal parts; three tolas of this mixture are to be boiled in forty-eight of water, until reduced to twelve tolas. To six tolas of this infusion add three of castor oil. Or take three tolas (nine drams) of castor oil, with six of milk. The purgative is varied according as the wind, phlegm, and bile, are deranged.

Another class of medicines, produce both vomiting and purging; they are—*kashataki*, several sorts of cucurbitaceous plants; *saptala*, (abrus precatorius); *shankhini* (cissampelos hexandra); *devadani rubitaka* (fruit and bark); *ravilika* (momordica charantica.) The juices of these plants are used for producing their effects, as the organs of speech for the articulation of vowels and sibilants.

4. *Pastes* composed of different purgative drugs were often used with great benefit. The following is an example, and was applied to the navel: Take of *ras*, quicksilver; *gomdak*, sulphur; *marick*, black pepper, of each a quarter tola; *sohaga*, biborate of soda; *pippoli*, long pepper; *shanthi*, dry ginger, of each half a tola; *dantibit*, croton polyandrum, two and a-quarter tolas, mix into a paste with the milky juice of *seejor* (euphorbium longifolium). Put it into the shell of a cocoa nut, which is to be coated with clay, and expose it to fire for two hours until the clay is red hot, and when cooled the dose of the paste is two tolas.

5. *Enemata.* This is considered as the best manner of exhibiting purgative medicines in diseases of the lower part of the abdomen, and lower extremities. Medicines may thus be mixed so as to cure diseases of wind, bile, and phlegm, as the medicine enters the system like water poured at the root of a tree. These medicines were much used by the ancient practitioners.

The general effect of enemas is to strengthen the muscles, and to lessen fat. They retain the eyes and surface in a healthy state—and will retain the body healthy till death, or even lengthen the period of existence.

The bladders of pigs, buffalos, &c., are used for these injections. For this purpose the animal should be healthy, and of full age. Should bladders not be found a leather bag may be substituted. The injecting pipe should be made of gold, silver, copper, iron, hard wood, or ivory. It should be smooth, strong, and tapering like the tail of a cow, with a slightly tuberculated extremity, six finger's breadth in length to the cross piece, for patients from the first to the eighth year of age; eight or ten from the ninth to the sixteenth year; and afterwards somewhat longer. During the first years, the tube should be the size of the little finger, afterwards of the ring finger, then of the middle

finger; and after the twenty-fifth year, the size of the thumb. In administering enemata, care must be taken not to introduce it in an oblique direction, nor too far nor too short a distance, and not to press it on one side. The size of the injection should also be varied, according to the size of the patient's hands.

For the very young, two handsful of the liquid are to be used; for a child of eight years, four; and from sixteen upwards, eight handsful.

There are two varieties of glysters, one without and another with oil. The first form of enemata shoud be prepared with honey and ghee; animal and vegetable broths should likewise be administered. The following is offered as an example of a glyster in costiveness, piles, dyspepsia, intermittent fever, in diseases of the loins, back, and intestines. It should be prepared as follows:—

Take of the decoction of *suttee; pushkara*, a kind of costus; *krishnapaka*, cariss carondas; *madana*, datura metal; *dubdaru*, uvaria longifolia, *kustha*, costus speciosus; *yasti madhu*, liquorice; *villa*, assafœtida; add ten parts of milk and four of oil; mix and administer warm. Various other glysters are prepared in much the same way.

This form of administering medicine is very useful when not too frequently employed, in fever

diarrhœa, and dysentery; in diseases of the head and eyes; in tetanus; in convulsions, and in many nervous, and other diseases.

Enemata are not proper for the very young, or very old, for the timid, or those labouring under grief, for women before the third or fourth month of pregnancy, in madness, in piles, jaundice, in fainting, in indigestion, in vomiting, leprosy, dropsy, asthma, cough, diseases of the throat, diseases of wind, such as swelling of the extremities, or in nervous diseases.

Two-thirds of the usual quantity of food should be taken before glysters are administered; and when given after eating they often produce vomiting.

Before the injection is administered, the body is to be cleaned and anointed, the patient is to rest in the lap of a large man, in a clean situation, where there are no currents of air; he is to recline on his left side, and in an hour the enema will operate. If it does not operate properly, it will diminish the internal heat, increase the urine, and will not purify the body. It first discharges the dejections, the bile, phlegm, and wind; and in this manner purifies the body.

Injections by the urethra. These should be used by a tube fourteen fingers' breadth in length, with an opening of the size to allow a mustard seed to

pass. For the female, the tube should be four fingers' breadth in length, and the opening capable of allowing the passage of a small pea. The tube should be covered with oil, and gently introduced, while pressure is made on the bladder, over the pubis, and the marks fixed on the tube prevents its being introduced too far. The injection should be two tolas in quantity; and is used for diseases of the semen, of the bladder, and the uterus.

When there is a burning in the bladder, an injection of honey, sugar, or a decoction of liquorice and cold water is given. In some cases injections of ghee are used, and in others astringent injections, such as decoctions of the bark of the banian tree, After the introduction of the injection, the patient should take bland drinks, such as barley water, congee, or animal broths.

The evacuation by purgatives, emetics, enemata, and blood-letting, leaves the patient with the internal fire diminished, and on that account heavy food should be avoided, and light and nourishing food taken.

6. *Errhines.* This is a large class of local irritants, and they are used with the intention of producing sneezing, and exciting a discharge from the nostrils, by which the head is supposed to be cleared from the presence of bad humours.

There are four varieties of fumes used as errhines :—

1. The varieties of smoke are taken by the nostrils at three efforts. For this purpose different spices are ground into powder, and a tube is used twelve fingers' breadth in length, the size of the little finger at one end, and tapering to the size of the thumb at the other, with an aperture the size of a small pea. For eight fingers' breadth the tube on the inside is to be covered with silk cloth, over which the medicine is rubbed. The tube, thus prepared, is to be set fire to, and the fumes are to be drawn into the nostrils.

2. Oily masses, made with wax, different gums ; such as gum-resin, with ghee, are lighted, and the fumes are received into the nostril.

3. Those which clear the head, are made with medicines which irritate the nostrils, such as black pepper, long pepper, and *aguru*, a kind of fragrant wood. These are to be made into a paste, with which the tube is covered, and then lighted. The fumes produce the effect desired.

4. Those which cause vomiting, are formed by burning the skin and hair of animals, dry fish and flesh, and substances which produce vomiting. The smoke should be taken in first by the mouth and evacuated through the nostrils, and when

taken by the nostrils it should be passed through the mouth.

These are the usual forms in which errhines are given for promoting the secretion of the mucous membrane of the glottis, trachea, and air cells of the lungs. In diseases of the throat and chest, the smoke is to be taken by the mouth; and by the nose, when the head, nose, and eyes are affected. Some are employed to cure cough.

These medicaments are prepared with sugar, the juice of the sugar-cane, milk, ghee, and animal broths, which clear the head. They are used for diseases of the heart, as in fainting; and for weak and delicate persons. Those prepared with medicines which clear the head of pent-up humours, accompanied with weight and pain of the head, are usually of an oily nature, and are introduced into the nostrils by means of a tube. This form is likewise used in diseases of the throat, particularly swelling, when worms infest the head and nose; in jaundice; in polypus of the nose, when the person can neither distinguish taste nor smell, oily substances are usually employed. It is used in diseases of the mouth, eye, and ear, caused by derangements of the phlegm.

Errhines prepared to clear the head, are

used in the form of powder, and in health, after waking from sleep, after fatigue, both in the morning and evening. These medicines are used in epilepsy, apoplexy, and other diseases producing a loss of sense, and cure diseases above the neck, and retard the marks of old age.

When phlegm is deranged, the errhines are to be given in the morning; when bile, at noon; and when the wind is deranged, in the evening.

Errhines should not be employed in hæmoptysis, after emetics and purgatives, in swelling of the abdomen (udara), in involuntary discharges of the semen, in sudden blindness, and when the wind is deranged after eating much food, or drinking wine; after poisons, wounds, or injuries of the head; in jaundice, when the person cannot sleep, or when he is very thirsty.

Fumigations. Sores are frequently recommended to be fumigated. For this purpose a tube is used eight fingers' breadth in length, and the fumes of the medicine are to be conveyed so as to be brought into contact with the surface of the sores.

7. *Gargles.* The quantity should be such as can be moved about in the mouth. The patient should stand erect. He should attend to what he is doing, and when the fluid is mixed with the bad

humours of the mouth, nose, or eyes, it is to be evacuated, and another portion is to be taken into the mouth. Gargles usually consist of astringent decoctions, or the juice of acid fruits, black pepper, long pepper, dry ginger, vacha, mustard, mixed with oil, vinegar, wine, cow's urine, salt or honey, according to the disease, &c. They may be used either hot or cold, and when properly employed they cure diseases of the mouth, clean it, and sooth the part.

8. *Emmenagogues.* The remedies for restoring or bringing on the menstrual discharge, are vinegar and acids, cow's urine, curdled milk, and wine. They are not often used, and as the irregularities are often produced by weakness, tonics are frequently given.

9. *Diuretics.* This important class of medicines is used in strangury, in pain of the bladder, in scanty urine, and in gravel and stone. They are used either in decoction or in powder.

10. *Parturifacients.* Medicines for promoting the expulsion of the fœtus from the womb, were not known by the Hindu practitioners. In cases of lingering labour, manipulation used to be employed to advance delivery.

11. *Sialogogues.* Medicines for increasing the secretion from the mouth when too dry, were often

had recourse to for expelling morbid humours from its neighbourhood. They should never be used before the fifth year of age. The chief medicines belonging to this class, are calomel and corrosive sublimate. The other medicines of this class, are black and long pepper, dry ginger, rock salt, acid fruits, *vacha*, and other hot spices.

12. *Stimulants* are either local or general, and act by increasing the vital power. Local stimuli either produce a determination of blood to the part, a secretion of semen, or the formation of pustules. These substances are made into a paste and applied over the part. The general stimulants include carminatives, which stimulate the stomach and intestinal canal, and lead to the expulsion of flatulence. This numerous class of medicines have already been enumerated, under the head of aliments; which are used in powder or decoction, with or without other medicines.

13. *Astringents.* There is a considerable list of astringents used for curing diarrhœa and dysentery, and of astringent tonics for the cure of ulcers, and for stopping hœmorrhage.

Among the *Anthelmintics*, the *biringa viranga* is the Embelia Ribes, and is still used as such in different parts of India.

14. *Alteratives* are medicines which increase

strength by removing diseased functions. It is only to adults and old people that this class of medicines is administered; and before giving it, an emetic or a purgative should be exhibited, as a cloth should first be cleaned before it is dried. There are four kinds of alteratives. The first promotes pleasure; the second cures diseases; the third increases memory and longevity; and the fourth prevents the usual changes of life, such as age, thirst, hunger, &c. 1. Cold water, milk, honey, and ghee may be taken internally, mixed or separately, to restore a proper degree of strength to the body. 2. Another kind of alteratives increases the memory, and lengthens the person's life. Various medicines are recommended for this purpose, and are powdered and mixed with sugar, kept in a vessel for seven days, and then used with cold water. During this treatment the person should reside in a close room, and continue the medicine for six months. He should only use rice, milk, and sugar for food, and bathe in cold water towards evening. His memory will thus be improved, and he may live for a hundred years. This plan of treatment may be adopted in leprosy and dropsy, with the addition of cow's urine instead of water. With this medicine the juice of the *mandukaparm* (Hydrocotyle Asiatica) is

exhibited, after which milk should be taken, and barley, rice, and ghee exhibited for three months. 3. Another kind retains the person young, prevents the hair turning gray, and the teeth from falling out. If a man use cold water, milk, honey, or ghee, separately or together, he will not soon have the marks of old age. For the same purpose other medicines are recommended.

15. *Tonics, &c.* The Soma, sacred medicine, is said to produce longevity, and removes the marks of age. There are many fancied varieties of such medicines, unknown to the present sinful race of mankind. Numerous other drugs of this class are used for increasing the pleasure of the society of women; these are considered nutritious diet, as ghee and animal food, wholesome drink, good news, anointing the body, especially towards the full moon, the presence of young women, love songs, clear nights, beautiful gardens, and a fine prospect; also the use of betel-nut, wine, flowers, such as garlands round the neck, sweet smells, &c., are thought to have this effect. The powder of *Vidara* (Flacourtia cataphracta), with ghee and honey, and also the powder of Amalaka (Phyllanthus Emlica) mixed with sugar, honey, and ghee, the flour of barley, &c., with milk and the seeds of Atmagupta, (carpopogon pruriens) increase the

person's happiness and his desires. These will be diminished when bitter, hot, salt, or sour articles of food are eaten, which diminish the fluids. In like manner, desire will be removed by its abuse, by certain diseases of the external organs, and by the division of the vessels.

16. *Oleaginous applications*, such as oil, ghee, fat, &c., may be given by the mouth as food, as laxatives, as errhines, as enemata, as unguents, or as injections for the ear and urethra. There are two kinds, vegetable and animal oils. Of the latter cow's ghee is the best, and the sesamum seed oil is the best of the vegetable variety. Some of this class of medicines are digested with difficulty, others with less difficulty, and a third kind easily. Ghee is good for weak persons who have a bad memory, or who are affected with poison, and diseases of wind and bile. Oil is to be used externally, but it may be given internally in cases of worms, and in costiveness. Warm water should be taken after the oleaginous substances.

17. Agents acting by depressing the vital powers are *Refrigerants*, such as cold infusions both internally and externally. Fire is also used.

18. *Narcotics.* Very few narcotics are mentioned in the ancient works; ganja or bhang, the resin of hemp, was used, and also datura. They

likewise employed bish (aconitum ferox), kakola, (cocculus indicus); kaephul, (strychnos, nux vomica.)

The Bujjerbhang of the Arabians, and the Dhumrapatra of the Hindus were, perhaps, the nicotiana tabacum of Linneus. According to a proclamation of the Emperor Jehangir (mentioned in his memoirs), tobacco was introduced into India, either in his, or the preceding reign. It was discovered in Yucatan, a province in Mexico, in 1520 (Humboldt). Were not some of the varieties employed in Europe before this date?

18. *Chemical Agents.* These medicines are, 1st, Escharotics and caustics: which will be considered under the chapter on surgery. 2d, *Lithontriptics*, or solvents of urinary stone or gravel, are sometimes employed; for which purpose the usual diuretics are exhibited, particularly *Arjuna*, (Pentaptera Arjuna,) and *Ashwavedaka* (Plectranthus scutellaroides, Roxb.)

When administered by an ignorant person, medicine is a poison, and compared to the knife, fire, or lightning; but when administered with the necessary knowledge, it is like the water of immortality. There are said to be two kinds of medicine, one of which gives strength to the body when no disease exists, and the other

arrests and cures diseases when they are present. In like manner poison may be administered in a proper manner, with great advantage in the cure of disease.

CHAPTER XII.

POISONS AND THEIR ANTIDOTES, (*Kalpas'thana*).

It is necessary for the practitioner to have a knowledge of the symptoms of the different poisons and their antidotes, "as the enemies of the Raja, bad women, and ungrateful servants, sometimes mix poison with food." The cook requires to be of a good family, virtuous, faithful, and not covetous, nor subject to anger, pride, or laziness. He should also be cleanly, and skilful in his business. The practitioner should have like qualities, with an intimate knowledge of poisons; and should examine the food to be eaten by a Raja in the cooking-room. This room should be large, airy, light, and surrounded with faithful servants, and no one should be allowed to enter unless he is first examined. In the *Mitakshara* shastra there are

copious directions regarding the manner of detecting a person who gives poison: he does not answer questions, or his answers are evasive; he speaks nonsense, rubs the great toe along the ground, and shivers; his face is discoloured; he rubs the roots of the hair with his fingers; and he tries by every means to leave the house. The food which is suspected should be first given to certain animals, and if they die, it is to be avoided. The authority the Brahmins assumed in detecting crime, and the confidence they inspired, has, no doubt, often had the best effect, in making the wicked shrink from perpetrating deeds, which were sure of detection. The long list of poisons given, seems to prove the frequency with which they were employed for criminal purposes in Asia, at a very early period.

All poisons have the following qualities: they are drying, heating, and stimulating; their effects quickly extend over all the body; they destroy quickly, are not digested, and from the rapidity with which they often produce dangerous symptoms it is difficult to use remedies with sufficient quickness. The following stages of the effects of poisons are observed:—1st. The tongue becomes black and rigid, the person faints, and breathes with difficulty. 2nd. Shivering, perspiration, heat, and

pain in the stomach and chest. 3rd. Severe pain in the stomach, swelling and yellowness of the eyes, and when the poison has extended to the intestines, pain of the abdomen, hiccough, sickness and vomiting, and a peculiar noise in the intestines. 4th. Heaviness of the head. 5th. Discharge of saliva from the mouth; change of colour of the skin, and pain in the joints and belly. 6th. Insensibility and purging. 7th. Rigidity and death.

Vegetable poisons, when dried by the fire, the air, or the sun, and given in solution, or in any way whereby their effects are rendered less powerful, may not produce immediate death, but remain in the system for a long time. In this case the first effects are looseness, heavy smell of the mouth, great thirst, fainting, vomiting, and paralysis of the tongue. These are followed when taken into the stomach by diseases of phlegm and wind, and in the intestines, by diseases of the bile and wind. The person's hair falls off. When the poison is mixed with the humours of the body it produces diseases such as leprosy, langour, weakness of the joints, and pain over the body; swelling of the legs and face, dropsy: In other cases there is vomiting and diarrhœa, intermittent fever, discoloration of the

body, madness, impotency, &c., all of which symptoms are aggravated in cloudy and damp weather.

Such effects may be removed by proper treatment, and a year after the person has taken the poison he will either be cured, or get worse. When the patient is weak, and has no appetite, poison will destroy him.

Poisons are usually arranged into two classes, the first consisting of vegetable and mineral poisons, are named *Sthavarah ;* and the second, of animal poisons, *Jangama.* They are not used internally as medicines.

1. *Vegetable and Mineral poisons.* The general symptoms produced by vegetable poisons are fever, hiccough, grinding of the teeth, suffocation, foaming at the mouth, vomiting, want of appetite, difficulty of breathing, and fainting. They are divided into nine varieties, which are derived from the roots, leaves, fruits, flowers, bark, milky juice, gum, and pith of plants. A list of each sort is given, with the symptoms they produce and the remedies to be employed in each case.

The *Mineral poisons* produce faintness, langour, burning of the body, indigestion, horripilation, swelling and dysentery. The dejections of a person who has taken poison are of a black colour,

large, and are discharged with wind. The mineral poisons enumerated by Susruta are the white oxide of arsenic, and the yellow sulphurate of arsenic. To which other authors have added sulphurate of copper (*tuttha*), white oxide of arsenic, and the like. These when administered to a person, produce pain in the chest and body, fainting, shivering, followed by a burning and swelling of the body, but particularly of the throat; succeeded by thirst, diarrhœa, langour, coma, and insensibility, when the disease will be fatal.

Antidotes for vegetable and mineral poisons. In the first stage of the effects of these poisons, give cold water to drink, with an emetic. In the second stage, give an emetic, with a preparation of vegetable decoctions, which is mixed with honey and ghee, followed by a purgative. In the third stage, errhines and collyrii are to be used, followed by the exhibition of ghee, honey, and a decoction of liquorice. The patient is then to be treated as for dysentery, with astringents and errhines.

In all the stages the antiphlogistic treatment is to be followed, with the exhibition of ghee and honey. Congee water is also to be given, mixed with a decoction of different medicines from the vegetable kingdom.

When poisons are introduced into a wound, by a poisoned arrow, the part quickly swells, blood flows, and from time to time pus is evacuated. The wound becomes of a black colour, and dirty round its edges, with a bad smell, and sloughing. The person is very thirsty and faintish, and the body becomes very hot. The same symptoms will be produced when poison is placed over a sore.

II. *Animal poisons.* Susruta states that serpents which live in holes have their poison lodged in their teeth, and it is of such an acid and hot quality, that cooling remedies are required to prevent the dangerous effects.

There are supposed to be eighty varieties of common serpents, which are again divided into five classes, according as their poison affects the fat, the viscera or organs, the bones, the marrow, and the semen, which last is followed by death.

The treatment of such poisons should consist in immediately applying a tight bandage above the bitten part. This may be done by a piece of cloth, a piece of leather, the flexible bark of a tree, or the like; so as to prevent the poison entering the system. When a bandage cannot be so applied, the bitten part is to be destroyed, either by cutting it out, and washing and cleansing the wound, or by exhausting the air in a horn placed

over it, and then burning the part. When the mouth is used, place a piece of bladder over it first, and then suck. Different prayers are to be used as the bandage is applied; but a scientific man should not rely on these alone, and other means should be used, as antidotes, &c., to prevent the effects of the poison. When the poison has reached the head, the person should be bled; and cold water, prepared with *Chandana* (sirium myrtifolium, a fragrant wood), and *Usira* (andropogon muricatum, a cooling root), is to be used for bathing; and internally different antidotes are to be given, mixed with honey. If these antidotes are not at hand, give the black earth of ants-nests, or *Sirisa* (mimosa siris), and *Kurbudára* (black helibore); and avoid spirits or wine. Fluids that cause vomiting are of use, as the poison is thus removed from the system. If these means did not succeed, they recommended the bad practice of bleeding, which promotes absorption of the poison; and gave honey and ghee. The errhines and collyria were thought likewise of use, when composed of different antidotes. In the fourth stage, emetics, followed by barley-meal for food, were recommended; in the fifth and sixth stages, an antiphlogistic treatment, and in the seventh, strong errhines, as ammonia, &c.

The above treatment is applicable to the bites of all serpents; but when the class of *Rajïla* serpents have inflicted the bite, bleeding is specially recommended. When the treatment is not successful, and the person is insensible, a crucial incision is made on the crown of the head, and a piece of recent flesh of an animal is applied to the wound; then errhines are exhibited, and a loud noise is made to rouse the person, and when his senses return, a strong purgative is given. The antidotes should be continued for some time after the symptoms have disappeared, otherwise the violent symptoms will be liable to recur.

The following varieties of *Agada*, or never-failing antidotes, are given in Susruta. For animal poisons, especially for serpents, take of Trivrit (convolvulus turpethum), Bishala (aconitum ferox), Madaka (bassica latifolia), Haridra (curcum alonga), Dára haridra (c. xanthorhizon), Raktá (nymphœa odorata), Arjuna (terminalia).

The five salts, with long pepper, black pepper, and ginger powder, are mixed with honey, and kept in a close vessel. They are to be given internally in water, and used at the same time as a collyrium and errhine. This is considered the most efficacious antidote known.

The following is an antidote for animal and

vegetable poison:—Take of Biranga (verbesina prostrata), Pata (sida lanceolaria), Trifola (the varieties of myrobalan), Ajamooda (apium involacratum), Hingu (asafœtida), Chakra (citrus decumanus), mix with black pepper, long pepper, dry ginger, and the different kinds of salt. Reduce them to a powder, mix them well with honey, and keep them in the horn of a cow. This is to be shut with a piece of *pith*, and kept for a month. It may be used as an antidote for animal, vegetable, and mineral poisons.

Different other varieties of these antidotes are given in Susruta, &c., but these two are considered the most efficacious.

When animals are affected by animal poisons, their bodies become swollen, they are sluggish, and saliva proceeds from their mouths, and there is pain in the chest. In the third stage there is pain in the head, they cannot raise it, the body shivers, and they become insensible and die.

Birds, when affected with poison, first become sluggish, then senseless, and die. Certain poisons do not affect cats, or the mongoose.

The bites of mad dogs. When dogs, jackals, foxes, wolves, bears, or tigers become mad, they foam at the mouth, which remains open, their tails hang down, they do not hear or see well, and

saliva flows from their mouths. In such a state they snap at, and bite each other. The part that is bitten becomes senseless, blood flows from the wound, which becomes black, and the other appearances are observed, as after a wound with a poisoned arrow. The person bitten makes the same kind of noise and movements as that of the animal which has bitten him. When such a person sees the shape of the animal, which has bitten him, either in water or in a glass, it is an unfavourable symptom. It is also unfavourable when the person is afraid of water, and dreads either seeing or hearing it. This is called hydrophobia—the fear of water. When the person dreams of the rabid animal, it is unfavourable. Towards the termination of the disease, the person is convulsed, becomes insensible, and powerless, and dies.

In all such cases the first part of the treatment should be to scarify the part, and squeeze out the blood, after which the part is to be washed and burned by means of hot ghee. Then apply to the wounded part a mixture of certain antidotes, and give old ghee internally. Errhines are also to be given with the milk of the *Arka* plant (calotropis gigantea.) Apply also the *Sita*, *Punarnaba* (trianthema monogynia), *Dhatura* (datura metel), or the flesh of animals; and *Til* oil, jagry, milk of

Rupikà mixed and applied to the wound. By such means the poison may be destroyed soon after the infliction of the wounds.

Susruta recommends the following, which is to be used both externally and internally: Take of *Shirisha*, *Kushtha*, *Haridra*, *Shita*, *Sharshapa*, of each forty ratas, mix in a pint of water, and boil until reduced to one-fourth. During the treatment the patient should be kept in a cool situation, without any water. When the symptoms disappear, the person should then bathe, and on the third and fifth days the above cakes are to be administered in half the dose given at first. He is then to take rice and milk. It is recommended in these cases to act powerfully on the system by strong medicines, before the poison has produced its constitutional effects. After the infliction of the wound, and before it has produced any general effects, the free use of water in bathing is recommended, and the bowels are to be afterwards opened by purgatives and emetics, followed by errhines to clear the passages.

The Poisons of Insects are divided into four classes, one of which deranges the wind, another the bile, a third the phlegm, and a fourth causes a combination of the three former symptoms.

There are eighteen insects which derange wind,

as a kind of cricket, the centipede, &c. There are twenty-four of the second class which derange bile, as the wasp *(Barati)*, the bee *(Bhramara)*, &c. This class produce great heat and pain in the part wounded. There are thirteen which derange phlegm, such as the bug *(Kutuba)*, and other like insects; and there are twelve varieties of insects, the bites of which are very dangerous, as they affect the three humours, such as *Tunginása*, *Bihilaka*, &c.

The bites of venomous insects thus produce a derangement of the wind, bile, and phlegm, and the wounds are inflamed, brown, red, yellow, or black, according to circumstances. They are sometimes followed by fever, diarrhœa vomiting, thirst, or a burning sensation over the body. Sometimes there is a shivering, the glands swell, and patches of an eruption of erysipelas appear over the body; the smaller insects, such as flies, gnats, mosquitoes, ants, &c., produce a painful itchiness, and swelling of the part bitten.

There are three varieties of the bites of scorpions, according as they are mild, strong, or very strong. Those which are generated in dunghills are not so poisonous as those generated in bricks, and dry places. Those generated in the putrid carcases of serpents and other venomous animals,

have the most violent poisons. There are twelve kinds of the first class, three of the second, and fifteen of the third, or dangerous kind. The symtoms resemble those produced by bites of serpents. The weak kinds produce pain, swelling, followed by shivering and fever, with perspiration, and stiffness of the body. The second class produce swelling of the tongue, so as to prevent swallowing, fainting, and severe pain. The third, or most dangerous class, produce delirium, fever, burning of the body, a discharge of black blood from the nose and other parts of the body. In this case the person soon dies.

In mild cases use frictions of oil, and a decoction of warm water with *Bidári*, (gmelina Asiatica,) and other sedative vegetables, and apply to the part a poultice made of the powder of turmeric, salt, long and black pepper, dry ginger, and *Sirisa*, (mimosa siris.) It is also recommended to apply the juice of the lemon, cow's urine, with the leaves of *Sirisa*; or cow-dung after it has been heated. Give internally honey with ghee, or milk with sugar, or cold water with sugar, and different kinds of sherbets.

The remarks on the poison of spiders, &c., afford a good illustration of the desire of the more modern Hindu sages, to explain things mytholo-

gically: they deduce its origin from the drops of perspiration falling from a demon in anger, upon the grass, and generating these insects. They distinguish sixteen varieties, of which the poisons of eight are cured with difficulty, and the poisons of eight imaginary ones are said to be incurable. The names of the first eight are given, and they produce headache, itchiness, pain, and swelling of the part, followed by hot fever and diarrhœa, with derangement of phlegm and wind. The eight other varieties produce sloughing of the part, discharge of blood, fever, burning, looseness, and diseases of the three humours. The general appearance of these eruptions over the body, is in the form of blotches or swellings. Some of them are large, others are soft or red, and others black. They pass from one part of the body to another. The first day after the bite, there is no change of colour in the part, which feels itchy. On the second day the part swells, and on the third the characteristic symptoms of the poison develope themselves. The constitution is affected on the fourth day, and on the fifth and sixth all the severe symptoms appear. On the seventh day the person dies, when the poison is strong. If the poison remains in the upper part of the stomach, it produces diseases of phlegm and wind; and if in the stomach itself,

diseases of wind and bile; in which case the hair falls off. Cloudy, windy, and cold weather increase the violence of the poison. These poisons produce drowsiness, languor, and pain in different parts of the body, and indigestion. Blotches appear over the body, the person loses flesh, his hands and feet swell; then follow faintness, vomiting, diarrhœa, sonorous breathing, thirst, fever, spasm, and swelling of the abdomen, with delirium. Each variety is treated in a particular manner, according to the symptoms. It is, however, unnecessary to descend to these particulars. In these dangerous cases the part should be cut out, and the actual cautery applied to the wound. The part is then to be rubbed with honey and salt. The person is also to have purgatives and emetics administered to him; and should there be much swelling, apply leeches.

The red lizard produces a black tinge and grey colour, or mottled colour over the body. This is accompanied with delirium and diarrhœa.

Frogs, if seized by a serpent and poisoned: should they escape, and bite a person, his hair stands on end, severe pain is felt over the body, and the part becomes insensible; it swells, and small pimples appear over it, with vomiting, drowsiness, and fever.

Fish poison produces great heat, swelling, and severe pain. Leeches, when poisonous, produce an itchiness, and swelling of the part, with pain and fainting.

When poisons have been removed, it is known by the patient's feeling well, the different fluids are healthy, his appetite, urine, and dejections are of the natural colour, the body has the usual appearance, and the senses and mind act properly. After the poison has been taken, let him drink goat's milk, until he vomits; this is to be repeated until it does not produce this effect, which proves that no more poison is present. Black coloured poison is never to be used as medicine.

III. *Use of Poisons as Medicines. Poisons such as Dhatura*, (datura metel,) *Amrita*, (aconitum,) *Aiphena*, (opium,) *Karabira* root, (nirium odorum,) *Arka*, (calotropis gigantea,) *Languli*, (gloriosa superba,) are powerful medicines when purified by being boiled in hot milk, or in water mixed with cow-dung for half an hour, after which the kernel of the seed is used internally, mixed with other stimulating medicines. Thus *Jaypal* (croton seeds) when it has been so boiled, is mixed with pepper, vermilion, and other medicines. This mixture is given in small doses in the beginning of fever. Datura is prepared in this same way, mixed with

other medicines, and used as a narcotic and stimulant. Euphorbium, and the root of the abrus precatorius, oleander, hellebore, and the different varieties of aconitum are prepared by reducing the roots to small pieces, soaking them in cow's urine, and three days before using them, removing them from the liquid; dry them in a strong heat, and administer them at first in doses the size of a mustard seed, increasing it for seven days, and then diminishing the dose. A leprous person may take one *gunja*, which is about the weight of one *rati*, or one and a half grains. When this poison has been administered in too large doses give goat's milk, which will produce vomiting, and thus remove the poison from the stomach. The dried bile of fish, goats, buffaloes, wild boars, or peacocks is sometimes administered as a stimulating medicine. These five varieties of bile are much employed as stimulants. They are purified by being macerated in the juice of lemon. (These different poisons, with croton seeds, are the chief ingredients in the celebrated modern "*bis bari*" or poisonous pills.)

Nux Vomica is prepared by being steeped for three days in conjee-water. It is then mixed with mustard oil and other drugs, and is used by the moderns as a powerful internal medicine in

small doses, and as an external application for the cure of leprosy.

Bitumen, Petroleum (Bhumataila), is got in hills in which gold and silver are found. It has the smell of cow's urine, and is bitter, salt, and cold. It is usually mixed with different other medicines, is supposed to have an alterative effect, and may be advantageously used in the cure of many diseases. The most common manner in which it is employed is as an external application in rheumatic complaints, and in cases of epilepsy, hysteria, and palsy.

Poisons when employed as medicines, should be taken internally, in the quantity of a mustard seed for the first day, increased for seven days, by adding the same quantity each day. For the next seven days, a quantity equal to a mustard seed, is to be taken from the dose each day. The third week, a quantity equal to a barley-corn in size is to be administered, increasing one each day; and the fourth week each day one less is to be given. No more is to be used unless in cases of leprosy, when the size of a *rati* is to be given.

Such medicines are to be taken with milk; but they must not be given to very hot-tempered persons, or to those with deranged bile, to eunuchs,

or to patients with bloody-sputa. When the person has a good appetite, or is very thirsty, or greatly fatigued, when any of the humours are weakened during pregnancy; in the house of a Rajah, or when there is a violent quarrel between the patient and another person, poisons must not be used in the treatment of disease.

The mineral poisons may be used in a diluted form as medicines. Such are the *Rasa-carpura*, (corrosive sublimate,) *Godanta*, (yellow orpiment,) *Tuttha*, (sulphate of copper) &c., which are prepared as medicines in the following manner: mix them with half their weight of sulphur, and expose them to heat for two hours. They may then be used in medicine, and will neither produce vomiting nor giddiness. The other poisons when prepared so as to diminish their power, may be employed with advantage in the cure of many diseases.

The *weak poisons*, such as *Akunda*, (asclepias gigantea), *Shevetdhristra*, (euphorbia), *Bisláṅguli*, (nama zeylanica), *Karabira*, (cleome pentaphylla), *Gusinga*, (rondeletia cinerea), *Tansphena*, *Noki*, (pontedera vaginalis), and other sweet smelling drugs. These are divided according to their colour and form, as like animals, ears, &c. They are mixed with cow's dung, honey, and conjee;

and are boiled, or made into a powder. They are then washed in pure water, and dried in the sun.

None of the above poisons should be given to a person under ten, or above eighty years of age. The practitioner should take a dose, so as to remove the fears and doubts of the patient.

CHAPTER X.

HYGIENE (*Pathapathya*), OR MEANS OF PRESERVING HEALTH.

THE Hindu legislators appear to have been convinced, at a very early period, of the importance of a knowledge of the means of preserving health, as we find various laws were enacted for this purpose; and in order to enforce these precepts among a primitive people, incapable of appreciating their importance, and disinclined to obey them, religion was employed to afford her powerful assistance. This explains the numerous precepts of Hygiene which we find in the sacred works of the ancient Asiatic people, which required to be varied with the climate, season, and the character and habits of the people.

The Hindus have a number of works on the means of retaining health. These form the relative and personal duties of the individual.

SECTION I.

RELATIVE DUTIES ARE THE EFFECTS OF CLIMATE AND SEASON ON HEALTH.

In the Hindu medical works, three climates are mentioned, the moist, the hot, and the mixed or temperate. The moist, or agricultural country, is distinguished by its upturned fields, with corn and other crops, interspersed with fruit trees, and intersected by rivers, mountains, and lakes. In such a climate the air is cool and temperate. There the sacred lotus and lilies, and other water flowers flourish; geese, ducks, cranes, and other such birds are common; and in the woods, buffaloes, wild hogs, and deer, etc, abound, and fish and serpents are numerous. In such a situation the inhabitants are unhealthy and short-lived, as diseases of wind and phlegm abound, and the inhabitants are fat, indolent, and weak. In such situations the juices of the body require to be dried up by the use of hot, dry, and light food in

small quantities, so as to strengthen the internal fire.

The second, or hot country, is characterised by the heat of the air, and by the prevalence of hot winds; by large and arid plains, covered with dwarf trees and prickly shrubs, growing at a distance from each other, and little water upon the surface. In such a climate the bamboo, the akanda (calotropis gigantea), the kul (zizyphus jujuba), the yagyadumur (ficus glomerata), the gab and kenduka (diosphyros glutinosa and D. melanoxylon), and the like trees are found. The inhabitants of such climates are remarkable for having little muscle and large bones, and being good workmen. The diseases of blood, wind, and bile, are most frequent; but the climate is healthy, and the inhabitants are long-lived.

When the heat and cold are more equable, they form the third or temperate climate, in which the derangements of the wind, bile, and phlegm are equalised, and the climate is favourable to longevity.

The inhabitants of such a fortunate region are stronger, more vigorous, and healthy, than in either of the other two climates. A person attentive to his regimen may live with impunity in any of the above climates; on going to a worse one,

derangement of the humours increases, and will destroy the person; but if he visits a better climate, the tendency to disease will be removed. A complicated disease will always be cured with difficulty, and the remedies must be varied according to the climate and season, and the age and constitution of the affected person. If this is not observed bad effects will follow, and various disorders will be produced. When one remedy does not produce the expected good effect, another should be substituted for it; but if a remedy does some good, it should be continued, in preference to a hundred others which have not been tried.

Seasons. The progress of the sun in the zodiac produces the six seasons, consisting of two months each. *Dewy months* are January and February, and are characterised by cold and dryness, which increase the wind and digestive fire. The diseases require the same treatment as during the cold season.

Spring season (March and April) is agreeable and fresh, and phlegm is increased. During this season athletic exercise is to be taken, as walking and riding, bathing, shampooing, and anointing with oil. For food, the boiled flesh of animals, winter rice, and food of a warm and dry nature, such as lessens phlegm, should be used, with con-

diments. Basking in the sun, and drinking river or boiled water, and sweet mixtures, with occasional purging and vomiting, should be employed.

Summer months (May and June) are hot, drying, increase bile, and diminish phlegm. These effects may be tempered by sandal-wood, cool air, and an open elevated house, with the shade of trees. The bed should be cooled with punkas and camphor water, the clothing light, and the person must remain in the shade. For food, boiled winter rice, old barley and wheat, the soups of wild animals, curds mixed with treacle, cardamums, cassia and cummen seed, fruits, honey, sugar cane, tamarinds, with pungent and sour juices, barley water, sugar and water, and clarified butter, are to be used, and quiet sleep enjoined. During this season shampooing and pungent saline juices, exposure to the sun's rays, and dry substances as food, which increases the heat, or temperature of the body, are to be avoided.

The *rainy season* is cooling, increases the tendency to dyspepsia, to cutaneous eruptions, and to diseases of wind. During this season (July and August), the sky is loaded with clouds, easterly winds, lightning and thunder, and rain prevail; the banks of rivers are overflown and low countries inundated; vegetation is

rapid, with various lilies and many coloured convolvuli. The air is cooled, the body is soft, the internal fire and the appetite diminished, and the food is heated in the stomach by the increased bile and phlegm. Food should be sparingly given, and generous in nature. Water and saline substances, such as rock-salt, are of use during this season. Persons should avoid fatigue, exposure to the sun's rays, swimming in the cold water of rivers, sleeping in the day, using substances of a drying nature, and things sharp to the stomach, and he should live in a high and dry house.

The *autumnal* season (September and October), is sultry and clear, and during it bile is augmented, and has a tendency to increase the heat of the constitution. During this time clarified butter, and sweet drying and bitter juices, cooling and light articles, with sugar, &c., milk, the flesh of jungle animals, winter rice, pond and river water, are to be taken. The use of camphor and sandal-wood, and the wearing of clean clothes, with the relaxation of swimming, and purgatives to evacuate the bile, and blood-letting in strong persons, are useful. At the same time curds, much exercise, shampooing, sour, pungent, hot, and acid articles of food, sleeping during the day, and exposure to excessive heat and cold are to be avoided.

In the *winter months* (November and December), exposure to the sun, residing in warm houses, warm clothing, especially to the feet, the use of a covering to the head, exercise, and shampooing, are useful. During this season clarified butter, salted fish, the flesh of peacocks, condiments, and drinks prepared with treacle, honey, and rice, are beneficial to health; while intemperance in eating, pungent and bitter juices, and whatever increases wind are to be avoided. Bilious diseases are diminished, and phlegm diseases are increased.

The humours are thus affected by the seasons; the wind increases in summer, predominates in the rainy season, and diminishes in autumn; bile increases in the rainy season, predominates in the autumn, and diminishes in the dewy and cold months; phlegm increases in the autumnal, predominates in the dewy, and diminishes in the spring months. These influences are modified by the judicious employment of diet; and when necessary, by medicine. Sleeping after a meal diminishes wind and bile, increases phlegm, and the fat and comfort of the body. Sleep is likewise recommended for diminishing bile, shampooing for wind, vomiting for phlegm, and fasting for fever.

SECTION II.

PERSONAL DUTIES.

THE Hindus have paid great attention to diet and regimen; and numerous works have been prepared for describing the food suitable for health and disease, and favourable for the operation of medicine.

As a general rule, the use of fresh meat, new boiled rice, milk, and clarified butter, sleeping with a young wife, and bathing in warm water, are conducive to health; and Manu states that bodies are cleansed by water, the mind is purified by birth, the vital spirit by theology and devotion, and the understanding by knowledge.* The personal duties are, rising from bed in the morning, cleaning the mouth and bathing, anointing the body, clothing, housing, sleeping, with use of exercise, food, and drink. It is proper to rise from bed some time before sun-rise, and after morning prayers, to perform the duties of nature, with the face towards the north. The teeth should not be cleaned before the tenth year of the child's age; after which they are to be cleaned

* Chap. v. sec. 109.

with a piece of a fresh branch of the neem, catechu, or other trees, made into a soft brush: but this is to be avoided, when it produces vomiting, when the food is not properly digested, in diarrhœa, in spasmodic colic, in diseases of the teeth, during the first eight days of fever, in asthma, when the mouth is dry, in cough, in epilepsy, in pain in the chest, in paralysis, in otitis, in hiccough, in fainting, in headache, and in diseases of the eyes. When a powder is used for cleaning the teeth, it is to be formed of honey, long pepper, dry ginger, &c. The mouth, eyes, and face are washed with water. The nails, beard, and hair of the head, are to be kept clean, and trimmed every fifth day, which promotes strength, longevity, purity, and tranquility of mind.

Bathing. The following are the most common kinds of baths:—1st. The cold bath removes the impurities, inordinate heat and irritation of the surface, and retains the blood pure. The use of cold water strengthens vision, but in winter, deranges phlegm and wind, and during the hot season, warm bathing increases bile and blood. Bathing is not proper in diarrhœa, in the beginning of fever, in diseases of the ears, or in those of the wind, in swellings of the abdomen, in indigestion, and after eating. The cold bath is used

in some inflammatory fevers, and in madness, and locally in some external inflammatory swellings. 2nd. The warm water-bath is often prepared with medicinal plants, and is used either locally or generally, for relieving pain in different kinds of fevers, spasmodic affections, &c. 3rd. Vapour baths are much employed for removing pain. They are made by heating a quantity of water in an earthen pot, over which a lid has been placed. The patient is first well rubbed with oil, and then sits on a chair, over a pot of hot water, with a covering of clothes thrown over both. When any particular part of the body is pained, this part is exposed to the steam-bath, and in other cases, medicinal plants are added to increase the good effects of the remedy, as neem leaves, and other such drugs. 4th. Hot cataplasms of medicinal plants are sometimes made into a paste, heated, and applied locally to relieve pain. In other cases, these medicines are applied locally, by means of hot vapour. A tube is used to convey the vapour to the desired part. 5th. Another form is the frequent application of a hot hand, a heated cloth, or a bag filled with hot sand, or salt, for relieving local pain, and for promoting the warmth of the body, when it becomes cold in any disease. In some cases the earth is heated, and a plantain

leaf is extended over it, upon which the person lies. After bathing the female applies Súrmá to the edges of the eyelids; which improves the sight, clears the itchiness, corrects any unhealthy humours of the eyes, improves the expression of the face, and prevents the bad effects of the glare of the sun, and diseases of the eyes in general. Persons should not use this preparation of antimony, who have sat up during the night, who are much fatigued, who have vomited, who have eaten recently, or who are feverish.

The Hindus, and all Asiatics, usually anoint their bodies daily with oil, more especially their heads, ears, and feet; which is supposed to be conducive to health. It diminishes the diseases of wind and phlegm, increases the seven dhatu, and improves the marrow, and the color of the skin, and the organs of sense. It cures diseases of the feet, prevents painful cramps of the fingers, and, so long as the head is kept moistened with oil, it prevents headache, improves the hair, and prevents its becoming grey. In all cases in which bathing is to be avoided, the anointing of the body will be advantageous to the person's health. Using it increases happiness, procreation, and other desirable objects. The body should not be anointed at the beginning of fever, when the

food is not digested, or after purging, vomiting, and enemas.

Whenever the Hindu feels indisposed the body is anointed with oil, on the same principle on which Solomon, in his Proverbs, speaks of administering ointment "which rejoices the heart, which may be a healing medicine to the navel," etc. In this case the oil was a mixture of vegetable oils, to render its effects more permanent. The hot climate and slight Hindu clothing, and exposure to a burning sun, increases the action of the cutaneous vessels, and renders the skin hard and dry; and if perfect cleanliness is not observed, it becomes encrusted with its own discharges, and with foreign matter which irritates and prevents the proper action of this important organ. To prevent such a consequence, oil is ordered by the Hindu shastres to be rubbed over the surface before it has been washed, by which it is rendered soft and pliant; it also promotes an equable perspiration, and an excessive degree of perspiration is avoided, which would weaken the body. Mustard or other oils are used. Several oils are prepared with medicinal plants and used internally; and some are applied externally in different cases of disease, especially in old fevers, spasmodic, paralytic, and rheumatic diseases, in affections of

the mind, as madness, &c.; and these oils are supposed by the Hindus to be thus used more advantageously than when given internally.

Clothing. After bathing the body is to be well dried and rubbed. Silk and warm red clothes diminish the diseases of wind and phlegm, and should be used in the winter season; and clothing should be light, cool, and thin, during the hot weather. In rainy and cold weather, warm clothes of a medium thickness are to be used. A piece of cotton cloth tied round their loins is all the clothing some of the poorer classes of natives wear; and it is when they appear in public that they cover their heads and shoulders. The modern turban defends the head from heat and cold, and is supposed to prevent the determination of humours to the head. A single piece of coarse cotton cloth, several yards in length, is the usual dress of females. Such clothes, particularly with the addition of ornaments, are supposed to prevent the approach of devils, increase strength, and retain the heart happy and contented. Sandals are worn on the feet to strengthen and protect them.

The umbrella is a modern mark of rank, and protects the person from rain, wind, dust, and the sun's rays. A walking stick protects the person

against beasts, prevents fatigue, and adds dignity to the individual.

Housing. The native houses are well adapted for the climate, being raised from the ground by prepared earth, with which the walls are likewise formed, and a thick thatch covers them, and extends beyond the walls, so as to form a protection from the heavy rains. They are usually well ventilated, by a space left between the walls and the thatch. These houses are divided into apartments to suit the convenience of the family, and the mud-walls and the thatched roof keep them in an equable temperature. In consequence of the unsettled state of many parts of the country, the houses of a Hindu family or tribe are usually built in the form of a square, for the protection of their cattle, &c., or in a series of squares, for the mutual protection of families. The open central space is usually kept covered over in days of festivity, when the prescribed ceremonies to their tutelar gods are performed in a room in the north side of the square.

Sleep. "Early to bed and early to rise," is one of the old and most approved maxims of the Hindus; which, indeed, is peculiarly applicable in a hot climate, where the night air, in unhealthy situations, is so pernicious, and the mornings so

cool and agreeable. The Hindus sleep on a pretty large mat, with a small sized pillow for the head, generally upon the ground, or upon a charpay. The mat should be soft and clean, and not circular; the head is to be turned towards the east, or rising sun; or south, whither the person goes after death, and where reside the gods. Care is taken not to turn the feet towards the father or mother or superiors. To have refreshing sleep, the mind of the person should be tranquil and contented. This will also be promoted by music, and rocking; by anointing the body with oil; by the use of the bath; by eating new rice, milk, ghee, and the like; by sherbets and spirits, and such articles as improve the health; by sleeping upon a large mat, in a comfortable house, and at the accustomed time. Sleep keeps the humours in a healthy state, improves the colour of the skin, the health, appetite, and strength.

Watching increases wind, dries the body, and diminishes phlegm and fat, and retards the action of poison. Sleeping during the day increases phlegm and fat, and should be avoided by those in whom phlegm is increased, during the spring, the rains, and the winter months, &c. It may be indulged in during the hot season, when the habit has been acquired, and when the wind is deranged.

Exercise increases strength, prevents and cures disease, by equalising the humours; it prevents fatness and laziness, and increases the firmness of the body. Walking is always to be used by those persons who live on rich food. Evening and morning are the best times, especially in the cold and spring months. When the mouth is always dry, with difficulty of breathing; in diseases of the wind and bile; in boyhood and old age, after eating, and before the food is thoroughly digested; or when there are sores upon the body, exercise is to be avoided. Should much exercise be taken, it produces phlegm, fever, and vomiting; after exercise, quietude is proper, as it increases strength, cures a superabundance of fat, and removes the feeling of fatigue.

Shampooing cures diseased phlegm, wind, and fat, the members are retained healthy as well as the skin, and it increases internal heat.

Food gives strength and colour to the body, it supports the heat of the body, retains the humours in their just proportion, supports health, and promotes longevity. When a person does not eat when hungry, the internal fire or digestion is weakened, and there is a consumption of the humours, followed by that of life and strength.

Charaka divides food into stewed, boiled, and

hard food that requires to be chewed, and liquid food. Susruta arranges food into the varieties of rice and corn, fruits, varieties of flesh, oils, flowers, fruits and herbs, salt and prepared food, and drink, including water and various spirituous liquors.

Some wholesome substances are like poison to the system, when mixed and prepared in an improper manner, such as pumkins, mushrooms, bamboo-shoots, plums, dried vegetables, unleavened bread, goat's or sheep's flesh, pig's flesh, salt food when taken with milk. Red rice, which grows in the cold season, wheat, barley, and other grain of the same kind, are good; whereas rice which has sprouted, fat, honey, milk, jagree, when eaten with the flesh of amphibious animals, or with fish, are so bad as to resemble poison. Milk, with honey and vegetables, and various other specified articles, should not be used together. Vegetables are most commonly used by the Hindus, and when animal food is used, the bile is to be carefully evacuated, or it will derange the person's health. Pigeons fried with mustard oil, honey mixed with rain-water and kept in brass pots for ten days, should be avoided.

2nd. Food may act unfavourably by the

quantity which is taken. Thus, honey and ghee, oil and marrow, or honey and water, oil and ghee, and fat, are bad when eaten in large and equal proportions.

3rd. The following mixture of articles possessing certain tastes are improper, as sweet and sour articles, sweet and salt, sweet and pungent, sweet and bitter substances, or bitter and salt articles, as they form bad chyle, and thus digestion is deranged. Such general remarks on food are not applicable to the health of the young and strong, to those who live in pure air, and take much exercise, and to those accustomed to their use, to whom such care is not necessary. But in ordinary circumstances, when their bad effects are felt, recourse must be had to the use of emetics and purgatives, and such medicines as have a tendency to equalise the humours. The articles of food which are wholesome from mixture and preparation are those which derange wind and diminish bile. The opposite articles of food which moderate wind and derange bile, are unwholesome; but the kind of food must be varied according to the age, habits, and seasons, as well as to the individual idiosyncrasy. The action of the vessels in which food or medicine is taken is carefully noted according as metallic or earthen pots, or leaves

are employed. Food and medicines are also divided into six different classes, according to their effects on the senses.

Sweet articles of food increase the milk and the fat, while they improve the eyesight, and relieve asthma, worms, and affections of the throat. They also increase phlegm, the strength of the tissues and the humours, retain the body in health, and promote longevity.

Acid articles of food promote appetite, are cooling before, and heating after eating. They promote digestion, and restore irregularities and derangements in the wind, bile, and phlegm. When they have been often taken, they produce weakness and emaciation of the body, and sometimes they produce blindness (nyctalopia).

Salt articles of food relax the bowels, promote digestion, and increase appetite. They, also, promote perspiration, remove derangements of the wind, bile, phlegm, and blood, produce a glossiness of the surface of the body, diminish or cure aphrodisia, are cooling, and heal sores. If long continued, they derange the humours, the skin becomes covered with irregularities upon its surface, followed by scurvy or leprosy, and by symptoms produced by poisons.

Bitter food is not pleasant to the taste, but is

dry and light to the stomach, increases bile and air, and produces dryness, heat, and diseased milk. It corrects too much bile and phlegm; but if always eaten it has a bad effect, deranging the humours and producing diseases of wind.

Pungent articles of food are of a drying nature, increasing the appetite and milk, and diminishing thirst and fever. They cure diseases of phlegm; but if eaten for some time, and in considerable quantities, they produce thirst, weakness, and derange the spleen.

Astringent articles of food are cooling, and cure diseases of the bile, and phlegm. They produce costiveness, stop diarrhæa, thicken the dejections, remove diseases of the skin, and heal wounds, and sores. But if taken for some time, they produce costiveness, a swelling of the abdomen, thirst and weakness, and retard the circulation of fluids in the body. Such observances are considered to be most necessary for health.

The different articles of food, employed to nourish the body, and obtained from the vegetable and animal kingdoms, may next be considered, with a few remarks on condiments.

Articles of Food derived from the Vegetable kingdom. The parts of vegetables employed for food are the leaves, flowers, fruit, wood, branches,

roots, and mushrooms. They are more easily digested in the above order, which is followed in the Hindu medical works; but a more convenient arrangement will be that in which the different articles came into use, as the food of man.

Fruits. The form and size of fruits would soon fix the attention of mankind, and they, with the culmeniferous and leguminous vegetables, would form the primordial food of man. In Hindustan there are a great many indigenous specimens of fruits: such as varieties of plantain (banana musa), jack fruit (arto curpus), melon, cocoa, the date, and the sago plant, form so many articles of food. Oranges, lemons, and citrons, which increase bile, improve the appetite, and cure dyspepsia. *Drupes:* Of the genus Amygdalus, &c., gourds, apricots, prunes, prunus Armeniaca, and P. Cerasus. The cucurbitaceous fruits, as gourds, have from the earliest times constituted an important part in the diet of the Hindus.

Vegetables are not easily digested, as they increase wind, bile, and phlegm, produce worms, and constipate the bowels. They are rendered more wholesome when boiled and seasoned. If employed alone for food they derange the system, affecting particularly the colour of the skin and eyes. The indigenous esculent roots, and hot and

salad herbs, are numerous, and the properties of each are given in the Hindu medical works, with their effects on different humours and diseases.

The graminivorous seeds form a numerous class, which afford the chief article of diet to a large proportion of the inhabitants of Asia. The principal varieties of corn and pulse were derived from Asia, and they are peculiarly fruitful in Hindustan, and from their hard consistence they may be kept in a good state for a long period. A large population lives almost entirely on rice, of which there are numerous varieties. Each is supposed to produce peculiar effects on the body in its diseased state, when new and old, and when exhibited in different forms.

Wheat has been used as an article of food from time immemorial in Hindustan; it is considered nourishing, increases the appetite, flesh, strength, the seven humours, and improves the general health. It cures the diseases of wind and bile, and increases phlegm.

Barley is considered nourishing.

The list of *leguminous seeds* or pulse is very long; they should be eaten after being well boiled, or in the form of porridge or soup.

Animal food. It is probable that for many ages the use of the flesh of animals was unknown, from

the want of weapons, and the strength and activity of the animals. When brought into use, it was considered a great luxury, and the chief of the household acted the part of the butcher and cook. The flesh of animals was agreeable to the taste, increasing the bulk of the body, and the strength, and curing the diseases of wind. The writers of the more ancient shastres lived in cool air, and were accustomed to an active life, which required the use of more animal food than in the warmer and more southern districts. This better living promoted the superiority of the ancient Brahmins over their more degenerate descendants, who are small in stature, and generally incapable of those mental and corporeal exertions which first raise a people in the rank of a nation. The indigestible nature of the flesh of some of the animals of the country, with their unclean habits, rendered them objects of disgust. Pork, even in Europe, is sometimes unwholesome; in Asia, its effects often resemble those of poison. The flesh of some animals is not so healthy and digestible as in more temperate climates, where it is of a better quality. In hot and moist climates, the want of exercise and food during the greater part of the year, renders the flesh of such animals peculiarly unwholesome; and the belief

in the transmigration of souls must have prevented the general use of animal food. The ancient Hindus used for food the flesh of the cow, buffalo, deer, hare, goat, and sheep. Dried flesh removes fatigue, and is of use in diminishing bile, in curing the diseases of phlegm, and sores in the body. The flesh of wild animals was given to the sick, as it was considered less heating than the flesh of domestic animals. Animal fat and marrow were supposed to cure diseases of wind, and to increase cough, and the diseases of blood and bile. *Broths* were made of the flesh of these animals, and given to invalids; they cured old fevers, and increased strength, improved the voice and eye-sight, and cured boils. If given with rice, broths lighten the heart, and cure the diseases of bile. The Hindus are directed, at the same time, to abstain from hard and indigestible food, such as curds, milk, oil, jagree, with various kinds of pulse and leguminous plants.

Animal secretions. Milk is heavy, cooling, and sweet, gives a shining appearance to the skin, strengthens and fattens, and cures the diseases of wind, bile, and phlegm. Camels and goats' milk are sweet, cooling, binding, and promote the internal heat; they cure hæmoptysis and diseases of wind, bile, phlegm, and blood; because they eat

many medicinal plants, drink little water, and are very active. The milk of ewes, buffaloes, and mares, are all stated to have peculiar qualities, and general effects. Woman's milk strengthens the soul, and increases flesh, and the consistence of the circulating fluids; it should only be drunk fresh. The effect of milk is much increased by mixing it with the juice of different plants.

2. *Curdled milk* is useful in the cure of agues, diarrhœa, dyspepsia, and strangury, and it increases the phlegm and strength.

3. *Butter-milk* is good for persons who have taken poison, who are labouring under diarrhœa, dyspepsia, vomiting, strangury, jaundice, piles, spleen, and ague. Fresh butter is sweet and nourishing, and softens parts; it is cool, agreeable, diminishes bile and wind, and cures consumption, chronic cough, asthma, ulcers, piles, and tetanus. It is useful in madness, epilepsy, and ague. It diminishes wind and bile, improves the appetite, the memory, and the beauty of the body. Old ghee is said to cure sudden blindness, morbid discharges from the nose, eyes, and mouth; difficulty in breathing, fainting, leprosy, and epilepsy, diseases of the vagina; pains in the ears, eyes, and head; old fevers, carbuncle, and diseases of wind, bile, and phlegm.

Flesh of birds cures the diseases of wind, bile, and phlegm, improves the colour of the skin, is slightly heavy and sweet, increases the memory and appetite, and gives consistency to the alvine evacuations. The principal of these birds are partridge, jungle-cock, common cock, peacock, pigeons, water-wagtail, taylor-bird, duck, paddy-bird, &c.

Such birds as live on flowers are thin, and when eaten increase the bulk of the body; such as live on fish, increase bile; and such as eat rice, remove the diseases of wind.

The flesh of animals and birds is not good when tainted; and should be eaten the same day it has been killed. The upper part of the male and the lower part of the female are the heaviest, and the flesh of female quadrupeds and that of male birds are the easiest of digestion. The flesh of large animals which work much and eat little, is heavy in the following order:—head, shoulders, spleen, skin, liver, fore-feet and hind-feet, tail, testicles, abdomen, and urinary organs. The humours are heavy in the following order:—blood, flesh, fat, bones, marrow, and semen.

Fish produces a shining appearance of the skin, is slightly heating and sweet, and increases the wind, urine, and alvine secretions. Black and small

fish are light, and constipate. They increase the appetite and strength, cure wind, and are of use during convalescence. White fish increase wind, bile, and phlegm, are digested with difficulty, and produce a laxative effect upon the bowels. Fish-roes are pleasant and increase wind, phlegm, and semen, diminish the appetite, and produce a bitter state of the stomach. These properties of fish are increased and modified by mixing them with other articles of food, as with the leaves of certain trees, pumkins, &c., Turtles were used, and were stated to cure diseases of wind, to increase strength and memory, and to improve the eye-sight.

Sugar, made from the sugar-cane,* and prepared by evaporating the juice of palms, and called jaggary, has been known in the East from the earliest antiquity. The fresh juice is sweet and cooling, increases urine and strength, and cures the derangement of wind; it improves the dejections, and mitigates the diseases of blood and bile; and it gives a shining appearance to the skin. After the juice has been exposed to the air for some time, it is heavy to the stomach, and heating, cures derangements of the wind and phlegm, and increases the shining appearance of the skin.

* Sugar cane was known in India and Egypt from a very early period. —*Essay on Articles of Hindu Medicine, p.* 83.

Oils. There are numerous plants which furnish a large supply of oil from their seeds, which is extensively employed by the Hindus for the purpose of unction, and as an offering to their gods. Other oils are used in medicine, and possess the same qualities as the seeds from which they are extracted. On this account they are used for the same diseases. Vegetable oils are bitter and sweet, and are good for the skin, and alleviate all diseases. Oil is heating, when taken internally; it increases the diseases produced by bile, constipates the bowels, and lessens urine.

Water. The Hindus were very careful about their drinking water, and ascribed the appearance of many diseases to bad water. Pure water has no taste, and is considered as cooling, relaxing the body, and improving the senses and the general health. They considered the water of wells, or natural springs in the sandy beds of rivers, as the most wholesome, as it promotes digestion and strength; the river and fountain water at the bottom of high hills was considered less wholesome; and the most unhealthy was the water from brooks, and the stagnant water of tanks and reservoirs. This water was supposed to produce indigestion, obstructions, and lethargy, with a predisposition to fever.

Rain water, when preserved in a clean vessel, was supposed to cure the diseases of wind, bile, and phlegm, and to improve the health. Hail-water was considered peculiarly wholesome.

Water was supposed to be improved by boiling, and its effects were varied according to the quantity dissipated by evaporation. Water which has been boiled and drunk cold, cures wind, bile, and phlegm, also cough, fever, and constipation. It removes great fatness, and increases the internal fire.

Medicinal drinks. The usual *drink* for the sick is water, in which a little of the infusion of cinnamon and cassia has been mixed. By others, the drink is varied with the nature of the disease. When wind is deranged, water, to which the infusion of such medicines as cure this class of diseases, as long or black pepper, sugar, &c., is added. When *bile* is deranged, either pure water is given, or its cooling qualities are increased by the addition of the infusion of a fragrant grass, sugar-cane, &c. When *phlegm* is deranged, the infusion of cinnamon, black or long pepper, or cloves, &c., are to be added. In fever produced by derangement of wind, bile, and phlegm, the fresh juice of the *kau*-grass is recommended instead of water. In hæmoptysis the fresh juice of the pum-

kin and pomegranate are the best additions to drink. In cases of swelling or *dropsy*, an infusion of dry radish, ginger, &c., is to be used. In *leprosy*, the infusion of catechu is to be given, with the infusion of black pepper and sugar candy.

Condiments. In weak digestion, water mixed with camphor, or with native mint infused in it, is useful. Betelnut, camphor, cloves, long pepper, pepper, dry ginger, and other spices, are mixed with slaked lime, surrounded with the leaves of the *pan*, and chewed as a condiment. It cleans the throat and voice, promotes digestion, keeps the breath sweet, improves the senses, and gives an agreeable appearance to the person. It also increases strength, and should be used after vomiting, bathing, and sleeping. The Hindus also use nutmegs, cloves, cardamum-seeds, cinnamon, turmerick, mustard, sandal-wood, capsicum, coriander seed, aniseed, assafœtida, &c.

Wines. The vine thrives in the northern parts of Hindustan, where the grape is sometimes converted into wine. The grape is considered cooling and aperient, by the native practitioners. All wines are divided into sweet and sour; they increase bile, and diminish phlegm and wind. They are also tonic, stimulating, increasing the acuteness of the senses and appetite, and promoting

digestion and health when properly used. There were different kinds of wines used by the ancient Hindus, which received different names according to the fruits, flowers, and other substances from which they were prepared. Different spirituous liquors are enumerated in Susruta. In the Vedas the use of wines and spirits is forbidden.

When digestion has been completed, the state of the stomach will depend on the qualities of the food or medicine which had been taken. When bitter and astringent articles of food or medicine have been eaten, they produce a bitter state of the stomach; sour food produces a sweetness after digestion, and sweet and salt food produce sweet eructations from the stomach.

The *seasons* modify the effects of food. During the rains, light and stomachic food, with bitters, should be preferred, while liquids and oils are not to be used too freely; the drinking water should be boiled, and drunk with a little honey. In cloudy warm days, exercise is not to be taken in the open air; the bed-room should be airy and dry, and all persons should sleep upon a bedstead. In *autumn*, bitter and sweet articles of food should be used, and exercise taken in the evening. In *winter*, animal and oleaginous food should be used, warm baths and frictions, and exercise in the

morning. In *spring*, sour, sweet, and saline articles, with meat, are to be used; and the warm bath, with pedestrian exercise; and during the *hot* season, cooling fruits and sherbets, with rice, barley, curries, and light vegetables are to be used. The cold bath is then to be preferred, anointing the body with oil, and wearing thin dresses, and sleep may be allowed during the day.

CHAPTER XI.

SURGERY (*Sutra Sthana, Shalya or Salakya*).*

According to the Hindus, surgery considers the cure of external diseases by the hand, by instruments, or by topical applications. The accidents which must have frequently occured among a race of people devoted to hunting and agriculture, and the feuds that were so frequent among small states, induced the Hindu sages, at an early period, to attend to surgical diseases. This led them to believe that surgery had been the branch of medicine first cultivated, and explains the importance in which the ancient writers held this branch

* To remove rapidly; or the art of removing foreign substances from the body, particularly the arrow.

of the healing art, the attention which they bestowed upon it, and the ability with which they exercised it. The ancient Hindu practitioners were bold and expert surgeons, accustomed to perform cystotomy, lithotomy, embryotomy, autoplastic operations, couching for cataract, paracentesis thoracis and abdominis, &c. This energy, practical knowledge, and boldness in executing hazardous operations, forms a remarkable contrast to the ignorance and pusillanimity of the present low-caste surgeons of Bengal; which is the more remarkable as their medical works were supposed to have been prepared by divine sages, who would not compromise their character by recording precepts contrary to the ritual of their law, or at variance with the principles and prejudices of their countrymen. These changes were slowly growing out of the altered state of society; and were unsupported by the remarkable civil and moral, as well as medical institutions.

The Hindus explain the early age at which surgery was practised by the necessity of curing the wounds inflicted in the battles of the gods. At the great battle of the *Asuras* and *Devatás*, Jagya was severely wounded in the neck, and the Aswiní Kumára, or the practitioners of heaven, soon cured the wound. This pleased the Devatás

so much, that they were received among them with much respect, and a share of their honours is still bestowed upon them. Bramha also declared that the art of cutting, healing ulcers, setting bones, and using escharotics, was the first branch of the healing art imparted by the deity to mankind; and as the operations of surgery are rapidly performed, and afford immediate relief, they impart holiness, riches, and a good name to the performer, and will ensure his passage to heaven after death.

Surgery forms the first chapter of Susruta, and in the Ayur-veda, it is considered to form the first two of the eight departments of medical science; and Dhanwantaree was born to teach this, as well as the other departments of healing. He declares that *Shalya* is "the first and best of the medical sciences; less liable than any others to the fallacy of conjectural and inferential practice; pure in itself; perpetual in its applicability; the worthy produce of heaven, and certain source of fame." He declares that formerly there were no diseases among the gods, and wounds therefore first required treatment; but that surgery can only be practised with success when the practitioner is familiar with the practice of medicine, of which it is a branch.

SECTION I.

STRUCTURE OF THE BODY.

Susruta considered surgery as the branch of medicine most esteemed, and it had reached a high state of perfection at an early period.

The importance of surgeons possessing a knowledge of anatomy, with the nature and relative position of parts, to enable them to perform operations, was well known to the ancient Hindus. This has already been noticed at page 131 of this history; to which the reader is referred.

SECTION II.

NATURE OF SURGICAL DISEASES.

Inflammation (Vrana, *stotha or shepa), is considered with boils and tumours. Susruta divids inflammation into two kinds, those produced by accidents or external injuries, and the other by internal causes. Injuries of the body produce the

* *Vrana* differs from stotha, by the latter being accompanied with less acute inflammation, and not suppurating.

first kind of inflammation, while derangement of the wind, bile, phlegm, and blood, or their combinations, produce the second six varieties, the essential result being the formation of pus. In all cases the inflammation commences in one point from which it extends on all sides.

1. The variety of inflammation produced by derangements in the wind, is characterised by the swelling being irregular and soft, by its red or dark colour, and by its being sometimes large, and at other times small. The pain of this variety is sometimes severe and of various kinds, and it swells and ripens in different ways; the discharge being limpid.

2. The second variety of inflammation is produced by bile, and is characterised by the swelling being of a dark-red and yellowish tinge, or the colour of a ripe wild fig. The parts feel hot and painful, as from the application of a hot iron, and it is accompanied with fever. The swelling quickly forms, and ripens into a yellow discharge.

3. When the inflammation is produced by diseased phlegm, the swelling is elevated, with a rounded edge and central depression. It is cold and shining, of a pale yellow colour, with itching pain, The swelling slowly forms and ripens. The discharge from this form is white.

4, 5. When the three humours are deranged, the swelling is of different colours, and is accompanied with various degrees and kinds of pain, according as the one or other of the humours predominate; and the discharges are of different colours, but generally resemble bile and blood, being red, black, and yellow, and of various consistencies, and accompanied with dangerous fever. This is attended with heat of body, vomiting, and thirst. The person becomes languid, loses his appetite, and has no digestive power. Such a kind of derangement in a part is generally incurable, particularly after injuries. The same is often the result when the bile and blood are diseased in a part, and when the swelling becomes black. This variety of inflammation is always cured with difficulty, particularly when it forms quickly. Sometimes it becomes prominent as it ripens, at other times it remains flat.

6. When blood is deranged, producing inflammation, the swelling resembles that produced by deranged bile, but it is of a darker red colour. When large, it has a dark yellow colour, and is very hot and painful, with much fever.

Accidental inflammation, produced by wounds, bruises, &c., resembles the other varieties in the symptoms, and only varies in the treatment, by

cold applications being proper in this class, but not in the other. When the blood is deranged in this variety, it resembles bile, but is of a dark red colour. When wind, bile, and phlegm are much disordered, and when the physician does not apply proper medicines, or the patient does not eat or act in the proper manner, the wound will not heal.

Inflammation is divided into three stages, the invasion, the acute, and the suppurating stage. In the first there is not much heat nor discoloration, or hardness of the part. The pain and swelling is likewise slight. In this stage the inflammation is said to be unripe. In the second stage the pain is lancinating, or like the bites of ants, or as if they were running about. In other cases, the person feels as if the part was burnt, torn, pressed or bound; he becomes restless and uneasy, and the swelling is much increased and discoloured, accompanied with much heat, thirst, loss of appetite, and other symptoms of fever. This stage is called the ripening stage. The third stage is distinguished by the part becoming pale, the swelling diminishing, becoming soft and wrinkled, and the skin rough, scaly, and elastic. The pain becomes throbbing, with a feeling of itchiness; and when the abscess opens, the fever diminishes, and the appetite

returns. This is the ripe stage, and pus is produced by the wind, bile, and phlegm; the wind conveying, and the bile preparing the phlegm, derived from the blood, by which pus is formed. In inflammation the wind produces the pain, and the bile ripens the swelling.

The inflammation varies with the tissue which is involved in the disease, of which there are eight varieties, according as it affects the skin, flesh, vessels, tendons, bones, joints, abdomen, or sensible parts of the body. When confined to the skin, inflammation is cured quickly; but when it affects the other tissues, it is cured with more difficulty, and passes through the different stages. The wind, bile, and phlegm, when deranged internally, produces an inflammation, which is considered as a tumour when it appears at the pit of the stomach, umbilicus, anus, hypogastrium, or sides of the abdomen, groin, axilla, or in the right and left hypochondrium. It may likewise appear within the intestines. This internal inflammation varies in the same manner as the external does. When the former occurs in the anus, it retains the wind in the pelvis, and when it affects the bladder, strangury is the prominent symptom. When it occurs at the navel, there is hiccough and a gurgling noise in the abdomen; when the sides

are so affected, it is from diseased wind, and when the groin is concerned the loins and back feel very painful. When the axilla or groin is diseased, there is pain in the spine and loins. When the spleen is diseased, and when the chest is affected, the whole body is uneasy, and feels painful; and in the latter disease there is a copious secretion of phlegm; when the liver is affected with inflammation, it produces difficulty in breathing, with hiccough; and when the pancreas is so diseased, the person is continually wanting to drink. When the inflammation occurs in sensible parts, whether the disease be recent or ripe, whether it be large or small, it gives great pain. When the internal inflammation is above the navel, the pus will be discharged by the mouth, and when under this, the discharge takes place from the lower outlets, and the person will live, but in the former case he will die. When the breast, navel, or pelvis is diseased, the person will die, when it suppurates internally; but he may recover when the abscess bursts externally. The first five varieties of inflammation may be cured, but when produced by wind, bile, and phlegm together, the disease is incurable. All external tumours may be cured; but the internal ones are generally fatal. The unfavorable symptoms are retention of urine, and a

more or less painful swelling of the abdomen, with a discharge of pus and blood, vomiting, hiccough, thirst, pain all over the body, and sonorous respiration, when a fatal result may be expected.

It is of much importance that the surgeon should be able to detect the stage of the inflammation, as if the opening be made before the swelling is ripe, or if it is not opened when ripe, bad consequences will follow, in either variety. In such cases the surgeon will be known from the quack. This fellow, by opening the unripe inflammations, may make a cut into blood-vessels, tendons, &c., accompanied with a great discharge of blood, or followed by a great accession of pain: again, if the inflamed swelling is not opened when ripe, the pus burrows into the neighbouring parts, forming large cavities, or fistulous openings, which are cured with difficulty. In such cases, the pus, like fire, burns the surrounding parts, which like fuel, are consumed.

In the generality of cases of inflammation the cure will be soon accomplished, but if injudiciously treated, it will be tedious. The inflammation is of an unfavourable kind when the part is not prominent but shrivelled, when hard or very soft, when very prominent or very dark, when very cold or very hot, when of a black, yel-

low, red, or white colour, or when it has an unhealthy disagreeable appearance. It is also unfavourable when the pus is in large quantities, when the muscles, vessels, and tendons are numerous in the part; when the discharge has a fœtid smell, and has fibrous substances mixed up with it; when the swelling is large, or there are numerous small swellings; when bad blood is evacuated; and when the patient is very old.

The general indications to be followed in the cure of common inflammation are—the use of sedatives, local bleeding, poultices, opening the abscess, cleaning it, healing the breach of continuity, and lastly, restoring the natural colour to the part. Susruta describes sixty different measures to be employed in the cure of inflammation and ulceration; such as rubbing and anointing the part with certain medicines that dry it up,* pouring water upon the part, fomentations, frictions with ghee, poultices with maturating substances, and the observance of spare diet, with emetics, purgatives, &c. There are eight kinds of incisions which are to be used for the evacuation of the pus and blood; also means to promote adhesion, as pressure, stopping the bleeding, diminishing the

* External medicines are supposed to pass internally by the roots of the hair, and the perspiring pores.

heat, the application of thick poultices and astringents, the application of lint, covered with medicinal pastes, the use of oil, and the juice of certain plants, the application of certain powders to the ulcers, fumigations, means to depress elevations, and to increase or diminish the hardness of particular parts, and the application of caustic and cauteries. The last considerations are how to restore the natural colour to the part, to restore or remove hair, the employment of enemas, the application of certain leaves to the ulcers, the means to destroy worms, the use of tonics, of errhines, of gargles, and of fumigations, with regimen.

For maturing a swelling the best medicines are several oleaginous medicines, barks, seeds, and roots: linseed, carrots, the seeds of the morunga tree (surunga), of mustard seed, the flowers of suravijaz, and the sediment or lees of a kind of beer or spirit. These are all to be combined with heat. When the patient objects to the ripe abscess being opened with the lancet, the following mixture of medicines may be applied: the flower of the marking nut (bala); the leaves of the castor poleandrum (danti); the leaves of the lumbago zeylanica (chitra); or of the nerium odorum (corbeer). Pigeons or adjutants' dung is also recommended, and various escharotic substances.

Old ghee slightly heated is to be applied to the part. The food should be thin and light, consisting of the flesh of wild animals, and light boiled vegetables, mixed with oil and salt. The drink should consist of boiled water.

The opening of an abscess should be made when the swelling is soft, without pain, is undefined, and of the colour of the skin. A lancet should be used, which is immediately to be withdrawn when the pus is seen. In performing such an operation care should be taken to avoid the vital parts, large vessels, and tendons. When the abscess is large, the opening should be the length of two fingers breadth. When the abscess is prominent, oblong, and large, it will soon be cured; and in order that the operation be properly performed, the surgeon should possess the following qualities: boldness, steadiness, presence of mind, quickness; and he should possess a good instrument. Should a fistula exist with the inflammation it should be opened; and the incisions should be oblique, viz., in the eyebrows, cheeks, forehead, temples, eyelids, lips, gums, axilla, and groins. In the soles of the feet and the palms of the hands the incisions should be circular; and in the arms and penis cruciform incisions should be made, so as to prevent the wounding of nerves and vessels. After

the opening has been made, the patient's face is to be bathed with cold water, and he should be encouraged by kind language. The abscess is to be evacuated by pressure, and is to be cleaned with a piece of cloth wet in warm and astringent water. A tent made of a piece of rolled cloth and covered with a paste made of teel seeds, honey, and ghee, is put in the cut; and a pledget of cloth covered with a simple soothing ointment is to be put over the wounded part, with a poultice and bandage. The prescribed prayers are then to be repeated over the patient, and he is then to be removed to a well-aired sheltered room, and placed in a large bed, surrounded by cheerful friends. Directions are then to be given as to his diet and regimen; not to use indigestible food, as new rice, heavy pulse, and hot, bitter, salt, or sour articles of food; and to avoid violent exercise until the cicatrization is complete. Great care is to be taken to keep the patient clean, and the wound is to be dressed on the third day, and care is to be taken not to allow it to close too soon. In dangerous cases the abscess will often require to be dressed twice a-day, as it resembles a house on fire that requires prompt assistance.

Under the class of accidental inflammations, injuries are considered. By a wound, the wind

of the part is deranged, producing pain; and the blood is mixed with the bile and becomes disordered. In this manner pain, fever, thirst, and heat of the body occur, followed by the other symptoms of disordered bile. Under this head, swellings of all kinds are considered, as they always commence with a certain degree of inflammation.

Tumours, boils, and pustules. There are eight varieties of these, produced by wind, bile, and phlegm, either severally or combined; and the eighth by derangement of the blood. The cause of this disease is using too much heating, sour, acid, or heavy, indigestible, and salt food; or eating too freely, and exposing one's self to great heat, or to the vicissitudes of the weather. By such causes the humours are deranged, which act on the blood, flesh, skin, and bones, producing swellings accompanied with fever. Sometimes the boils are confined to one part, and in other cases form all over the body; when the wind is chiefly deranged, the disease is accompanied with headache, griping fever, thirst, and pain in the joints, and the swelling becomes dark coloured, with much pain. When diseased bile is the cause, there is much fever, and burning of the body, thirst, and a discharge from the swelling, and it becomes red or yellow.

When phlegm is deranged, the affection is accompanied with loss of appetite, vomiting, languor, dyspepsia, and the swelled part is itchy, hard, and white, without pain, and often does not suppurate, and when it does, it continues for a long time. When *wind* and *bile* are disordered, the pain is severe; and when phlegm and bile are affected, there is great itchiness in the part. When the three humours are deranged, and when the pustules are red and depressed in the centre, and hard, with slight purulent discharge, the disease is considered incurable. In such cases the patient complains of burning in the part, with drowsiness, rigors, fever, thirst, faintness, vomiting, and delirium. When the disease is produced by disordered blood, which probably includes aneurismal swellings; and where it assumes the appearance of the seed of gunga, that is, is red with a black spot or slough, the disease is considered incurable (Charaka.) The treatment will vary with the symptoms, requiring cooling and soothing remedies; when the disease is acute, tonics and stimulants. The decoction of the bitter *neem* and *gulancha* bark are much used. When the disease has a more atonic type, the bark and leaves of the subanjana and morunga are to be made into a paste, with old rice-water and salt, and applied to the part.

Susruta, also, described fungous and sarcomatous swellings, particularly of the scrotum, testicle, hœmorrhoidal tumours, hernias, &c.

Ulcers (Bruno.) Ulcers are either produced from external or internal causes. There are fifteen varieties, some say sixteen. Each of the deranged humours produce a variety, or a couple of the humours, and the three humours deranged at the same time, or when combined with deranged blood, produce the varieties in ulcers. There is another healthy ulcer which is characterised by having a smooth and equal surface, being soft, accompanied with little pain, and without any discharge.

When the ulcer is produced by deranged wind, it is characterised by its black or red appearance, is superficial, and discharges a cold, mucilaginous, and scanty matter. The pain is peculiar, being of a crackling stiff kind; and is often severe when it does not affect the flesh.

When deranged *bile* produces an ulcer, it is of a yellowish blue colour, and is surrounded by a red and yellow eruption, which spreads quickly, and discharges a hot and red matter with a burning pain.

When *phlegm* produces an ulcer, there is much itchiness, and it is deep-seated. The

vessels and nerves of the part are affected, and it is hard and white, without much pain, and the discharge is white, cold, mucilaginous, and thick. The part feels heavy.

When produced by blood, the ulcer becomes red, and is surrounded by black vessels. The smell is like that of a horse stable, with much pain, great heat, and it discharges blood, and is accompanied with symptoms of bile. The ulcers which are produced by the combination of the diseased humours partake of the peculiar symptoms of each.

Ulcers are likewise divided into large superficial, large deep seated, very hard and soft, much elevated or depressed, very cold or hot, very black, red, yellow, or white, or disagreeable looking ulcers; or covered with a slough, with a fœtid discharge, very painful or bloody discharge, or very old: all these are unfavourable forms of ulcer. When the discharge is yellow, thin, and has the smell of raw flesh, it is superficial. When the ulcer is situated in the flesh, the discharge is thick, white, and mucilaginous; and in blood-vessels, the discharge is with much blood, and it is also watery, with much purulent matter. When bones are affected, the discharge is mixed with oily matter and blood; when in the joints they

cannot be moved, and the discharge is mucilaginous, frothy, and bloody. When any of the internal viscera are affected, the discharge may be accompanied with urine, fæces, or a watery fluid.

The cure of ulcers is easy, when treated by a skilful practitioner, and when the patient follows the proper regimen; but when treated by an ignorant person, or if the patient does not follow the proper regimen, the cure will be much more difficult. The person should live in a large, airy, and clean house, upon a large bed, with his head towards the east; he should be encouraged by the presence and attention of friends; he should not sleep during the day, as it will produce much swelling, and a copious discharge with itchiness. He should avoid much walking, and the presence of women. He should avoid new wine, different kinds of peas, and fruits, too much salt, and pungent articles, jagree, cakes, dry vegetables, and the flesh of fish and amphibious animals. Cold water is likewise to be avoided, with curdled milk and indigestible food. He should avoid exposure to wind, dust, and smoke, too much eating, and disagreeable sounds or smells; to watching at night, and eating at unusual hours. He should keep his hair, beard, and nails short, wear clean clothes, perform the usual ceremonies

of religion, and his food should be light and nourishing.

The ulcers are to be dressed with a cloth covered with new ointment, and secured by a bandage of silk or cotton. They are to be cleaned with a watery decoction of cassia fistula, and other astringent vegetable medicines. Ghee should be prepared with the sulphate of iron, black hellebore, turmerick, and the root of the *jatie*, (Jasminum Grandiflorum). In other cases they add astringent barks or acid juices, as lemons, &c., yellow and red arsenic, powders prepared with rock-salt, sulphate of iron, and lees of urine, turmerick, &c. *Fumigations* and *Pastes* are also sometimes applied to ulcerated surfaces. When the ulcer is much elevated, the powders of the following substances are to be used: sulphuret of iron, rock-salt, red arsenic, mixed with egg-shells, and the buds of *jatie*. These may be combined, or one or two of them may be mixed, and applied to the ulcerated surface.

Purgatives, emetics, and fasting are to be occasionally used in ulcers, according to the indications which have been already stated under the head of treatment of inflammation. Should there be much bleeding from the ulcer it is to be stopped by means of styptics; when accompanied with fever

and much burning in the part, use cold applications; when there is little discharge, the ulcer being superficial, and the surface irregular, apply poultices made of seeds containing oil, as linseed, with fomentations. When the appearance is dark and the smell disagreeable, apply astringent decoctions; when sloughing and dry-looking, apply medicines to clean the part; when the edges of the ulcer are very hard, local bleeding by scarifications or by leeches is to be used with fomentations. Should the edges of the ulcer be soft and flabby, apply astringents; when the edges are elevated and of long standing, apply caustics; when the cicatrix is white it will be made dark, or of the natural colour, by the preparations of the marking nut. For restoring hair to a part apply the ashes of ivory with crude antimony; and should worms be generated in ulcers, apply the decoctions of ophiorrhiza mungos *(suruba)*, and Symplocos Alstonia.

When the worms are produced by application of cow's urine and the like, caustic solutions are to be applied. These are obtained from the ashes of certain trees. A piece of recent flesh may also be applied over the ulcer, so as to attract worms to it. When the ulcer is very old and the person emaciated and weak, give him nourishing food, and medicine of a tonic nature. When produced

by poison they are to be treated as poisonous wounds. The intelligent practitioner will thus vary the local and general treatment according to the peculiarity of the case, and the state of the patient's constitution. The fatal symptoms of ulcers are fever, diarrhœa, fainting, hiccough, vomiting, dyspepsia, difficulty of breathing, cough, and great thirst.

Fistulas (Nulla-Bruna.) A fistula is either produced by derangements of the humours, or by external causes. In the latter case the abscess may not have been opened when ripe, the pus burrows itself into the neighbouring parts, and forms a canal. When derangement of wind produces the fistula, the orifice is small, the surface is rough, and it is accompanied by much pain. It discharges largely, especially in the night, and the discharge is accompanied with froth. This form is to be treated with poultices.

When the fistula is produced by deranged bile, it is accompanied with thirst, fever, and heat; the discharge is copious, particularly during the day. The part is to be carefully rubbed; and when ripe, it is to be opened with a knife, cleaned, and a hot iron probe introduced into the canal. Several kinds of medicine are mixed sometimes, and thrust into the wound.

When produced by diseased phlegm, the discharge is thick and white, and the edges are hard and shining. It is itchy and slightly painful at night. A mixture of several medicines is rubbed into the part, so as to soften it. Other medicines are to be employed to wash the fistula with; a director is then introduced and the fistula laid open.

When wind, bile, and phlegm are deranged together, producing a fistula, it is accompanied with great heat and fever, sonorous breathing, and coma. The mouth is dry, and the other symptoms are present, peculiar to the diseases produced by the separate humours. In such cases the disease is incurable.

Fistulous openings are usually found in the mammæ of women after abscesses. In such cases the abscess is to be opened, and the fistula is to be healed from the bottom. When the patient is of a weak constitution, is emaciated, is fearful, and has lost her appetite, the cure will be difficult. When the knife is not allowed to be used, a thread is to be passed through the fistula, and may be strongly tied, so as to divide the skin over it; or a tent made of the following medicines will be found very useful. The bark of the *guntafula* tree, rock salt, lac stick, and beetle nut, are mixed

with the milk of the euphorbium, and introduced into the fistulous opening. Fistula-in-ano is a frequent distressing complaint in Asia, for which various excellent local remedies are employed.

SECTION III.

LOCAL APPLICATION OF REMEDIES.

These are fomentations and baths, unctuous applications, pastes, fumigations, blisters, cauteries, and styptics.

1. *Fomentations and baths.* Charaka recommends the affusion of cold water for diminishing the heat and pain in parts. For certain eruptions topical-baths, the sprinkling of water, cow's urine, &c., are used. Poultices of herbs are often of use; and tents, injections, and gargles are also employed by the surgeon.

2. *Unctuous applications and pastes* are a numerous class of local remedies. Mustard oil, honey, butter, and ghee are often medicated with various emollient, astringent, stimulant, and narcotic

substances, and taken internally as well as applied externally, in the form of liniments and pastes, with cow's urine and the juice of different trees and drugs, according to the effect required. The leaves of the neem-tree and marking-nut plant, verenga, myrobalans, &c., are applied with salts, as alkalies from the ashes of burnt vegetables, such as palas (butea frondosa), soot, &c. Sometimes metallic and mineral substances are employed, as the oxide of arsenic, lead, tin, or mercury, sulphur, &c.; and various ointments.

3. *Fumigations* by means of different combinations of resin, &c., are sometimes applied to heal ulcers, &c., with good effect.

4. *Blisters*, and local irritants, are used as derivitives, in certain internal diseases.

5. *Cauteries* The actual and potential cauteries were often employed by the ancient Hindu practitioners. The *actual cautery* was applied in the form of hot sand, substances in a state of combustion, boiling fluids of a gelatinous or mucous substance, heated metallic bars, or plates and probes of iron or bronze, which had often fanciful shapes, like the form of the rose apple, or serrated trident. These cauteries were particularly useful when applied to the temples, or forehead in headaches, to the eyelids for diseases of the eyes, to

indurations of the skin, to the abdomen for mesenteric enlargements, and to the sides for those of the liver and spleen: for the latter disease the remedy is often very useful, and is much employed by the Arabs and other Asiatics.*

The Hindus state that cauteries may sometimes be employed where the knife cannot be used, and as among the Greeks, the chief use of the actual cautery was in cases of hœmorrhages; the bleeding being stopped by searing the wounded vessels.

The actual cautery is applied in four different ways, according to the nature of the case; sometimes the application is made in spots, in other cases in circles, or in parallel and concentric lines. When the application is properly performed, there is a peculiar noise heard, and smell felt at the moment of the application, and the skin is immediately contracted. When the cautery is applied to the muscles, it changes them to a gray colour; the swelling of the part diminishes, and it stops the discharge of blood, pus, &c.

The milder application consists in washing the part with warm water, after which the places to be burnt are marked with so many drops of oil. These are covered with small pieces of young plantain

* Ferro bifurcato splenem adurit. Haly-abbas, 9 pract. ch. 76. Pro splene bidentatis et tridentatis setonibus utetur. Albucas lib. 1 chirc. 31.

leaves, and a wet cloth is laid over the whole. A piece of lighted stick of the wood of the jujube tree is applied to each spot. Little pain is felt upon the contact of the burning wood, but on removing the cloth and leaf, a mark is left, which ends in an ulcer. The more severe cautery consists in thrusting from seven to twenty iron needles heated red-hot, a considerable depth into the side over the spleen, so as to penetrate its substance. The operation is attended with great pain, and acts powerfully in reducing swellings, as of the enlarged spleen. The cautery is also applied in different ways, sometimes by means of heated long pepper, goats' dung, the tooth of a cow, or an arrow point. A long circular or hook shaped iron probe is applied for superficial purposes, and straight probes for muscles, or deep seated parts. There are three varieties of these irons, one being small, another large, and a third of a moderate size. After amputation, &c., the actual cautery or boiling fluids, as boiling jagree, oil, honey, &c.. are used to stop hœmorrhage.

Fire is useful in some diseases of the skin, flesh, vessels, ligaments, joints, and bones; in carbuncle, piles, boils near the anus, in elephantiasis, and in small swellings. In bites of serpents live charcoal is recommended to be applied,

to prevent the dangerous effects. It is also useful in penetrating wounds, and in all cases where wounds are accompanied with considerable hœmorrhage.

The small sized actual cautery is employed with advantage to the eyebrows, forehead and temples, for headaches and diseases of the head. When applied to the eyelids near the border, the eye is to be defended with wet cloths. This is the treatment recommended for Entropium. Fire is also applied to remove induration of parts: to the sides, in cases of diseased spleen and liver; and to the abdomen, in enlargement of the mesenteric glands. It is also applied to the soles of the feet for the cure of colic, and it is said with the best effects, as it seldom fails to cure the disease. A mixture of ghee and honey should be applied to the part after the cautery. Fire deranges the blood and bile, and produces severe pain and fever. The application of heated disks, or plates of iron, as rubifacients, to diseased parts, are employed with the best effects.

When the different cauteries have not proved sufficient to stop the hœmorrhage from a wound, the vessel may be opened above the bleeding part in order to diminish the flow of blood from the large wound below, and thus give time for the

operation of medicines. When all these means fail to stop the hœmorrhage, the physician is to examine the peculiar circumstances of the case, and act accordingly.

The actual cautery should not be used in the cold and hot months, as in September and October, or in May and June; more particularly in the two last months. It should not be used to persons of bilious or sanguineous temperaments; or in whom the blood is diseased; when diarrhœa is present, and external applications have not removed it; when the person is weak and timid; when there are many ulcers on the body; and when the patient is very young or very old.

The diet of a patient to whom the cautery is applied should be very thin, and of the same kind as that recommended for a woman with a dead fœtus in her abdomen. In the more dangerous forms no food is to be allowed.

Potential Cauteries. These cauteries consist of potash more or less pure; it is obtained by burning the bark and branches of the muckaka, kataya, and other trees. These are reduced to ashes, which are mixed in six times their quantity of water or cow's urine, concentrated with heat, and strained separately, until reduced to the consistence of a mucilage. It is again dissolved in

water, strained, the sediment removed, and the solution evaporated to the same consistence as before; some shell-lime is then mixed with it, and when neither very dry nor moist, it is taken off the fire, and kept in an iron vessel well closed up. Thus the carbonate of potash is directed to be dissolved in water, and shell-lime mixed with it. This is the process recommended for preparing a solution of potash in modern pharmacopœias. The potash thus prepared, may be used internally or externally. In the first form it is used in solution, and is good for removing worms, for curing leprosy, and as an antidote for certain poisons; when long taken it produces impotency. As an external application, it is used in three degrees of strength: the concentrated, the strong, and the weak.

The concentrated potash is used for opening abscesses, and for producing superficial ulcers, in which cases emollients are to be put upon the part after the application, so as to diminish the pain. The solution acts strongly in healing ulcers and in stopping bleeding, and when concentrated it disorganises the parts. It is applied externally to different cutaneous diseases, to bad ulcers, to fistula-in-ano and other fistulæ, to piles, to certain diseases of the mouth, to diseased tubercles, &c.

The weak solution may be taken internally in dyspepsia, colic, and indigestion; and for urinary calculi, gravel, worms, and swellings.

The use of potash is not proper in the sanguineous temperament, in internal hœmorrhage, in fever, for children or old people, for weak persons, or for persons with diseases of the eyes, &c. Caustics are not to be applied to vital parts, where there are many nerves and blood-vessels (ligatures), to the joints, ligaments, eyes, throat, &c. When used by an ignorant person, caustics are like fire, poison, or thunder to the patient, whom they quickly kill. When caustic is to be applied to a part, the patient is to be taken to a room shut up, and a portion of the caustic is then to be applied to the part by means of a hollow tube. The surgeon is to wait for a space of time that will admit of his counting one hundred. If properly applied, the part becomes black, and the part is to be moistened with the juices of acid fruits. When used by a skilful surgeon, the potential cautery cures many diseases.

Styptics. If all the bad blood is not removed by bleeding, it will leave a swelling, redness, heat, itchiness, and pain in the part. But if too much blood has been removed it produces headache, blindness, inflammation of the eye, convulsions, hemiplegia, great thirst, burning sensation of the

body, hiccough, difficulty in breathing, jaundice, and death. Avoid abstracting too much blood, particularly when it is healthy, as it is the root which sustains the body; "for the blood is the life of the body."

There are four ways of arresting hœmorrhages:—the use of astringents, ice, caustics, and the actual cautery.

1. *Astringent applications.* Different flowers and absorbent earths and resin are mixed together, and this powder is sprinkled by degrees over the part, and should the blood not stop, the finger is to be placed over the bleeding vessel, and retained there for some time. In other cases the barks of different trees, as the banyan tree, catechu, and gum resin, are mixed and used as styptics. The ashes of burnt silk will also be found useful, over which a tight bandage is to be applied. The patient is to be kept in a cool room, and a cold and antiphlogistic diet and regimen is to be enjoined. Afterwards broths, made from the flesh of deer and other wild animals, are to be used, with other light and nourishing food.

2. *Cold*, in the form of ice, by drying the blood, has a strong tendency to stop hœmorrhage, and is often used for this purpose.

3. When these means are not sufficient to stop

the bleeding, escharotics, and the actual and potential cauteries must be employed.

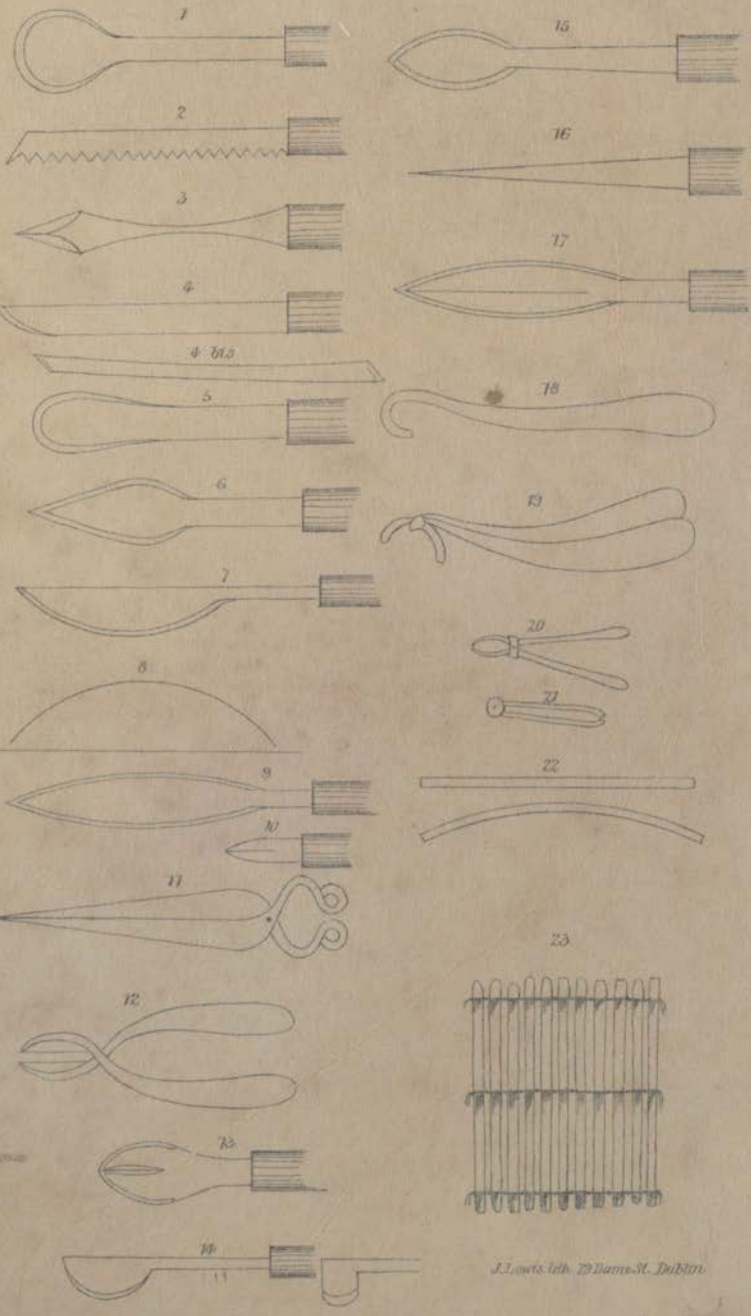
SECTION IV.

DESCRIPTION OF SURGICAL INSTRUMENTS AND BANDAGES.

The great variety of surgical instruments proves how carefully the ancient Hindus studied this branch of the healing art. The descriptions of these instruments not being precise, and not being illustrated by drawings, it is difficult always to understand their form. The hand is always represented as the first, the best, and the most important of all surgical instruments, as it is with its assistance that all operations are performed. The accompanying drawing represents specimens of the mechanical contrivances employed to assist the performance of operations, each of which has a different name, generally from its resemblance to some well known form of leaves, animals, &c. They should be made of the best iron, reduced to steel, a process early known to the Hindus. They are generally six inches in length, of which the

blade forms the half or quarter. They should have good handles and firm joints, be well polished, and sufficiently sharp to divide a hair; they should be quite clean, wrapped in flannel, and kept in a wooden box. There are twenty ancient cutting instruments described by Susruta, of which the following are specimens. No. 1, is a scarifier; and 4, 5, 6, 7, and 14, knives. These cutting instruments are employed to remove diseases, or deformities, to unite what has been separated, or to replace what is wanting in a part. Nos. 3, 9, 10, 16, 17 are varieties of lancets; 13 and 15 are trocars, for removing fluids from a part; and 12, cutting-nippers, for dividing bones, &c; 11, scissors; 2, a saw; and 8, needles for sewing. When the patient is too much afraid to admit of the use of cutting instruments, sharp pieces of bamboo, stone, or glass, the nail of the finger, rough leaves, &c., may be substituted. No. 4 is employed for cutting finger-nails, &c. There are one hundred-and-one blunt instruments described, such as curved or hooked instruments (Nos. 18 & 19), to remove teeth, and splinters of bones, or foreign bodies (Nos. 20 & 21). They are usually of iron, eighteen finger-breadths long, having heads shaped like those of animals, the beaks of birds, &c.: a smaller kind will remove foreign substances lodged in the ear, nose, &c.

There are twenty varieties of tubular instruments of different sizes and shapes (No. 22), including catheters, syringes, &c. They are used for removing obstructions or substances from deep-seated canals, as the intestines, urethra, etc.; for examining deep-seated parts; for drawing off fluids, &c. There are twenty-eight kinds of probes, rods, and sounds, varying in size and shape, for examining the size and nature of foreign objects, lodged in parts of difficult access; and for clearing canals, particularly the urethra. Some of these are rounded like a half-pea or earth-worm, or the point of an arrow; and another has a head like the foot-staff of a cylindrical form, like the malectee flower, and is often used in clearing the urethra. Some of these probes have small cavities at their extremities for applying caustics, &c., to the diseased part: very much the same form as is now used for strictures, and in some diseases of the vagina and uterus. Some rods have extremities like the rose-apple, and are curved; these are to be applied heated. A variety of forceps with claws, resembling the half of the stone of the plum, are for eradicating polypi, a frequent and troublesome disease in Hindostan; which is relieved by forcibly extracting the irritating excrescence. Other accessory instruments are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J. Lewis lith. 79 Dame St. Dublin.

also enumerated, as thread-bandages, leaves, leather, bark, silk cloth, loadstone, pins and tents. The finger-nails, tongue, teeth, &c., were also employed. There are many other instruments, varieties of the above, which must be modified by the surgeon to answer a particular purpose.

Bandages. The following are fourteen varieties of bandages: a hollow-cylinder or sheath for the finger, &c.; a large bandage to support parts; a circular bandage to be applied to joints, the forehead, chest, or neck; a roller; a broad bandage for the neck, and external organs of generation; a circular bandage for the head; a bandage enclosing a splint to keep the parts firm, as the joints of the fingers, &c.; a double-tailed bandage, to be applied to ulcers; a four-tailed bandage for the cheeks, temples, lower jaw, &c.; a bandage for the angles of the eyes; one for the back, abdomen, and chest, to form a firm circular bandage; a large bandage for the head; a concave bandage for the chin, eyes, lips, shoulders, scrotum, and pelvis; and a bandage for the clavicle, with four tails.

The surgeon is to decide on the kind of bandage in each particular case. Its application varies also with the disease. Sometimes the bandage is to be applied above, below, or upon the wound

or ulcer, according to the effect required. In general the bandage is to be adapted after the application of the necessary ointment spread upon linen. There are three degrees of tightness with which the bandage is to be applied, the first being tight, the second loose, and the third moderately tight. When bile and blood are deranged, or when blows and poisons produce the disease, the bandage should be loosely applied; and when phlegm and wind are deranged the tightness may be increased. To the chest, buttock, belly, loins, axilla, groins, and head, a tight bandage is to be applied. To the extremities, face, ears, throat, penis, scrotum, back, and to the sides of the belly and chest the pressure of the bandage should be moderate. In diseases of the eye and joints, loose bandages are to be used. Should the bandage be applied too tight the medicine will not produce the desired effect, and all the symptoms of the disease will be aggravated. This will also be the case when no bandage is applied, by the formation of insects, and by exposure to the influence of heat and cold, which will aggravate the symptoms and prevent the cure. When there is acute inflammation, and when the part is hot, painful, and sensible, no bandage is to be applied to the part for the cure of the disease, but only to retain

the remedies upon the part. Nor are bandages to be applied when the sore has been produced by fire, when it contains pus, when sloughing, when near the anus, when produced by extravasation of urine or leprosy, &c. If bones are fractured or joints dislocated, or if the bone is thrust through the flesh, bandages will be of much use. This is also the case when the tendons and vessels are divided. In the treatment of ulcers, bandages and all other means that diminish pain will tend towards the cure.

Ulcers in the flesh, skin, joints, bone, or abdomen, and wounds of vessels and tendons, whether deep or superficial, are cured with proper bandages. The judicious surgeon will in each particular case, decide on the propriety and kind of bandages, which will vary not only with the nature of the disease, but also with the season of the year, &c.

SECTION V.

PRACTICAL INSTRUCTIONS FOR SURGICAL OPERATIONS.

After the student had been taught the science of healing by books, he was next instructed in the

use of instruments, &c. Without practical skill, theoretical knowledge was considered of no use. The different surgical operations were shown to the student upon wax spread out upon a board, on gourds, cucumbers, and other soft fruits; tapping and puncturing was practised on a leather bag of water, or soft mud; scarifications and bleeding was practised upon the fresh hides of animals from which the hair has been removed, or upon dead bodies; and puncturing or lancing on the hollow stalks of water lilies, or the vessels of dead animals. Dexterity was thus acquired, before exercising it on the human body: the teacher being required to perfect his pupil by the employment of all expedients which he might think calculated to effect this proficiency. The manner of holding the knife, and using the probe, was practised upon a piece of hollow bamboo or the like; the removal of substances from cavities, by removing the large seeds of the jack fruit (artocarpus integrifolia), or bêl fruit (Ægle marmelos). The extraction of teeth was practised upon dead bodies and animals. Sewing was practised on leather and cloth. The application of bandages and ligatures was exercised upon flexible models of the human body; the means of making noses, ears, &c., was

practised upon dead animals; and the application of caustics and cauteries on animals. The use of injections was exercised with a water pot having a tube passing into it.

There are eight kinds of surgical operations: incision, as in fistula-in-ano; opening parts, as of large abscesses, or drawing lines, by which the parts are scarified, or inoculated; puncturing, as in opening veins, in hydrocele, and in dropsy; probing or sounding parts, as in fistula, to ascertain the presence of foreign substances; the operation of extraction, as of the stone, of the teeth, and of the fetus; removal of fluids, as pus, blood, &c., or of bad humours, as in leprous blotches, in elephantiasis, &c.; and, sewing parts together with thread or twine, or small ligatures made of the skin of animals, or fibres of vegetable substances, roots, hair, &c., as in wounds, especially near joints. The stitches are to be longer or shorter, according to the nature of the wound. Before sewing, the wound should be carefully cleaned, and all extraneous substances removed. The needles should be from two fingers breadth in length, to three or more. They were three-edged for deep flesh wounds, and a curved kind was used near vital parts, and in wounds of the scrotum and abdomen. For fixing a torn off ear,

the parts were to be brought together and sown. For practising these operations, pieces of leather and cloth were sewn together; and a mixture of equal parts of the seed of the *prianga*, sulphate of antimony, *ptaya*, liquorice, and an astringent bark, *(lodro)* was thickly sprinkled round the wound, which was then covered with a piece of lint or silk cloth, and the whole secured with a bandage. The physician is then to give proper directions for diet, &c.

Several operations were performed by the ancient Hindus which are not described here. Hœmorrhage was arrested by the application of astringents, cold, ice, caustics, and the actual cautery; and when an extremity was separated, boiling oil was poured upon the surface, and a cup-formed bandage applied over the face of the wound, followed by applications to heal it.

Besides the above instruments, the surgeon should provide thread, leaves, pledgets, heated metallic plates for erubescents, and a variety of astringent and emollient applications, before commencing an operation.

Blood-letting. The means of removing blood from the body were venesection, scarifying, cupping, and the use of leeches.

1. *Venesection.* Before a patient is bled, he

should have his body anointed with oil; take a warm bath; and eat some prepared barley or rice.

In performing the operation, the patient is to be placed either sitting or standing before the surgeon, with his face turned towards the east, with an assistant holding him from behind. The surgeon is to rub down the blood in the prominent vein which is to be opened, and apply a bandage of the bark of a tree, of cloth, or of leather, not very tight, above the part to be opened; the instrument used for opening the vein is the *kutharika*, or *brihiinukha*; the body is to be kept in the natural position, while this instrument is to be thrust into the swollen vein, the patient holding his breath; the wound should be the size of a barleycorn. The blood should flow in a stream. After the required quantity of blood has been obtained, the bandage is to be removed, and the wound is to be cleaned with cold water; a few drops of oil are to be left fall upon the wound, and if the bleeding is not stopped, a bandage is to be put round the part. Should this not be sufficient to stop the bleeding, caustics, and even the actual cautery, may be used. The quantity of blood which is to be removed, should never be so large as three pints, least it weaken the person.

When the patient is very strong, and the disease very severe, blood to the extent of one seer (Prastha or 2 lbs) may be removed. If much blood is lost, it will produce headache, loss of sight, with pain in the eyes, thirst, severe pain, insensibility of one side, or of one member, hiccough, cough, difficulty in breathing, jaundice, or diseases of wind; and the person may even die. After bleeding, the body should be anointed with oil, milk, lymph of animals, or other remedies which quickly stop the flow of blood. If all the bad blood is not discharged by the first bleeding, another is to be performed on the second or third day after the first. Do not endeavour to remove all the bad blood by the first bleeding, as a little may be purified by the use of remedies; and thus the danger of bleeding too freely will be avoided. When a swelling requires to be opened near the windpipe, care is required to avoid a vein, which might endanger life if wounded.

Bleeding should not be performed when the person is below sixteen and above seventy years of age, when the female is pregnant nor soon after delivery, nor when the body is dry; when in a state of drunkenness, nor when there are sores upon the body; when the humours are diminished; when there are copious perspirations; nor when

there are diseases of wind present. Patients should not be bled in very cold, hot, stormy, or cloudy days; when the person is weak, after watching, nor when digestion has not taken place. They should not be bled in general dropsy, in piles, in jaundice, asthma, and severe cough, during free perspiration, after vomiting or purging, in severe fevers, in tetanus, in palsy, &c. When venesection is to be performed, the air should be clear and warm. If possible, it should be avoided during the rains; and the abstraction is to take place by degrees, at intervals of one or more days, according to the circumstances of the case. In the cold weather venesection should be performed in the middle of the day. The flow of the blood from the wound in the vessel may be retarded when the person is very fearful, faint, and much fatigued; when he is very thirsty, when the bandage is not properly applied, and when he has much bad blood.

When the person is bled for a disease of the spleen, the vein is to be opened at the bend of the left arm; and between the left ring and little finger in asthma and severe cough: in diseases of the penis, near the middle of that organ. In hepatic diseases open the temporal artery. In madness and epilepsy, and in diseases of the

tongue or teeth, open the veins under the tongue. In tertian ague, open the veins at the juncture of the sacrum with the spine. In epilepsy, the veins of the neck may be opened.

There are twenty ways named of improperly performing venesection:—as when the instrument is too small, so that the blood does not flow freely, which is followed by a painful swelling; when an ignorant person opens a large vessel, or makes the wound in the vein oblique, through which the blood passes among the cellular substances of the part; when the knife is blunt and tears the parts, which swell; when several attempts have been made to open the vein; when the person is fearful, the weather very cold, and the blood is not discharged; when the knife is large, is sharp, and a large wound is made; and when the wound is too small, and little blood flows. Should the arm have been improperly bandaged, and the hands shake, and no blood flows; when there is a great flow of blood from the large wound in the vessel, which cannot be stopped by the usual application; when the wound is not direct, and the knife is not a proper one, and several attempts are required to open the vein. Should blood-letting not be proper; the patient's body in an unfit state, and diseases are consequently produced; when the

part requires to be rubbed much before the vein can be opened, and when the blood only flows at intervals like the milk of cows; when the knife is too small, and several small wounds are made in the vein; and when nerves, tendons, and vital parts have been wounded, so as to produce severe pain, restlessness, and sometimes death. Should the operation be thus improperly performed, the wound is to be treated by the application of fomentations, and other remedies, which will be stated in the section treating of wounds.

An able surgeon is therefore required to bleed; as veins are always changing, and if not properly performed, bleeding produces various troublesome diseases of veins, which are not cured by the usual remedies. It is not, therefore, enough to know the situation of veins; but he must likewise know the time, and the extent to which the bleeding is to be carried. In some diseases, bleeding is half the treatment; in the same manner as enemas are, in many medical diseases. As cutting, fire, &c., give pain; rajahs, rich people, children or old people, and fearful and weak people, when they require to lose blood, may have leeches in preference to venesection; more especially in the cases of bad blood produced by diseased wind, bile, and cough. When bad blood has been removed from a vein, the person feels

happy, and the part light, the pain ceases, and the morbid symptoms diminish.

After bleeding, avoid anger, violent exercise, too much sitting, walking, exposure to great heat or cold, or improper food, for a month; especially, very heating and cooling articles. The patient should live on good and light articles of nourishing food, until his strength is restored. If this is not attended to, bad blood will be generated. This produces itchiness, swelling, and pain like that of fire, with a red appearance of the part, which suppurates. When deranged wind has produced bad blood, it does not flow from the wound in the vein like water, it is covered with foam, is dark, thin, and flows slowly. When deranged by bile, the blood has a yellow blue colour, has a bad smell, and it flows slowly. When the blood is deranged by phlegm, the blood is oleaginous and smooth; it is cold, of a pale yellowish colour, is in large quantity, and flows slowly. When bile and blood are deranged in a part, it has a dark colour. When two or three of the humours are deranged in a part, the blood has the peculiarities of the individual, and of deranged blood combined. Should severe pain occur in opening a vein, as if fire had been applied, the part is to be rubbed with a mixture of warm ghee and *gestemodo*.

The blood is in a healthy state when it is of a bright red colour like that of red jelly, or of the rainbow; when the senses are perfect, with a desire to exercise them, and the person is strong and in high spirits.

2, 3. *Scarifications and Cupping.* Longitudinal and transverse lines at equal distance are made neither very deep nor superficial, by means of a thin and sharp knife. They should be applied quickly, avoiding vital parts, joints, and large vessels; and the evacuation of blood should be promoted by the application of cupping horns of animals, which are open at the small, and quite smooth at the large extremity. They are of different sizes, to suit the part upon which they are to be applied, and the quantity of the bad blood to be removed.

This extremity is applied over the scarified part, the air in the horn is sucked out, and the finger is then dexterously placed over the open upper end. An accumulation of blood in the part included in the horn is discharged from the scarified surface. The horn is repeatedly applied, and the air exhausted in the same manner, until the necessary quantity of blood has been removed. In other cases a leather bottle, or a hollow gourd (*alabu*) is prepared, with a small smooth hole which is placed on the part; the

air is then exhausted by burning something in it, before it is applied over the scarified part. The horn is used when the air of the part is particularly affected; and when the phlegm of the part is much diseased, the gourd is preferred. They are also used for dry cupping.

4. *Leeches (Jalouka).* Leeches have been employed from time immemorial in Asia, but particularly in Bengal, where they are considered as the best means of removing blood from a part.* They are particularly used for rajahs, for women, and timid persons, and for the very young and very old.

There are twelve varieties of leeches; six of which are venomous and six useful.

The venomous species of leeches are:—those having longitudinal lines of various tints along the back; large ones with black heads, and bodies covered with hairs; large dark leeches, with large heads; those of a dark yellowish colour, with numerous stripes and spots of various colours upon their bodies; those that have small heads, and narrow mouths, with large bodies and bifurcated tails; and those that are long, like an eel, and alternately contract and dilate in the middle.

These deleterious leeches, when they are em-

* Many Asiatics have a strong prejudice against general blood-letting, and never, or very rarely, employ it.

ployed, produce heat, swelling, pain, and itching of the part; followed by excessive irritation and fever, with spasms, sickness, and syncope. These effects will be best treated by applying to the bites a mixture of certain medicines, which are considered as antidotes against the poison. Other antidotes are given internally, with errhines; the bites of the Indrayudha leeches are considered fatal. These kinds of leeches are found near putrid fish or animals, in foul, stagnant, and putrescent water. Such leeches are consequently to be carefully avoided.

There are six varieties of good leeches:—

1. *Kapila*, or tawny leeches: which have a brownish breast, and greenish back, with smooth glossy sides.

2. *Pingula:* which have round bodies, are of a pale red colour, with large sharp mouths, and are very active.

3. *Sankhamukchi:* which have long sharp heads and mouths, are of a liver colour, and bite quickly.

4. *Mushika:* which are of a mouse colour, and have a bad smell.

5. *Pundurika-mukhi:* which are of a brown hue, have mouths like those of lilies.

6. *Shabarika:* which are of a green colour, like

the leaves of a water lotus, and are eighteen fingers-breadth long; this kind is only proper for removing blood from animals.

These leeches are found in Persia, ancient Delhi, at Mutra, &c. They are got in small numbers in clear and deep pools of water, which contain water lilies, and are surrounded with sweet smelling plants. The middle sized leeches are the best, and when they have not drawn enough of blood, the scarifying horn or leather bottle may be applied, and the air rarified to increase the flow of blood. Should the bleeding from leeches be too copious, it may be checked by the application of black salt (chimnie) and oil to the leech-bites.

These leeches are to be caught in a piece of leather or cloth, and placed in a new water-pot, in which some clay and pure water have been put; some mud, grass, or leaves of aquatic plants are to be placed on the pot for them to lie upon, and the roots of water lilies and dry flesh are to be given them for food. The water and food are to be changed every third day, and the water pot every seventh day.

When the leeches grow very large, and are very vigorous, when they are weak or emaciated, when they do not bite or take little food, or are of the venomous kind, they are not to be used.

When the part is not very sensible, it is to be rubbed dry, and covered with cow dung and earth to dry it thoroughly. The leech is then to be taken from the water-pot, and its body is to be anointed with mustard-seed paste or turmerick. It is then to be put into a basin with fresh water for a short time, and removed and surrounded with a piece of cloth, and the mouth is to be applied to the part affected. If it does not fix quickly, apply a drop or two of milk or blood to the part, or make one or two very slight scarifications, which will induce it to fix itself more readily. When the leeches are sucking, sprinkle a few drops of cold water upon their bodies; when they have removed the necessary quantity of blood, sprinkle a small quantity of salt upon their heads, to make them drop off. Put the gorged leech upon some dry bran, with a little oil and salt upon its mouth, and then strip them. Put them next in fresh water, and if they are lively they will live, and may be used again; but if they are languid, they will soon die, and they should therefore be at once thrown away.

The part upon which the leeches had fixed is to be smeared with honey, cold water, and astringent substances. In other cases, when inflammation occurs, poultices may be applied.

Wounds are of various shapes; one kind is simple, and another is complicated with the presence of a foreign body. Wounds vary with the part wounded, and the instruments by which they are inflicted. When the *skin* is wounded, it changes its colour, swells, and is hard; when the *flesh*, the swelling is greater, the wound gapes, discharges thick matter like ghee, and does not scab. When a *vessel* is wounded, it is accompanied with much pain, blood flows from the wound, which swells, and when it suppurates pus is discharged. When *tendons* are wounded, they swell, and the discharge is like ghee, or phlegm from the nose, and is mixed with blood; when *bone* is fractured, various degrees of pain are produced, the marrow disappears, and the colour of the bone changes to that of a cockle-shell. Pus and marrow are discharged from such wounds, and they are attended with pain not easily relieved.

The six varieties of wounds are—1, incised wounds, with a large open surface; and 2, penetrating wounds by pointed instruments, as the horn of a cow, &c. This wound discharges little externally, when it penetrates a cavity it fills it with blood. This is followed by fever, thirst, loss of appetite, difficult breathing, and the stoppage of the secretions, as urine and sweating. When the stomach

is wounded, it is accompanied with a vomiting of blood, and a swelling of the abdomen, with severe pain. When the small intestines are wounded there is much pain, with heaviness of the part, and cold extremities, &c. 3. Another variety is punctured wounds, when the sharp pointed and narrow instrument is retained in the wound; and a fourth, contused wounds. These four kinds of wounds are accompanied with a large discharge of blood; and if they are also accompanied with severe pain, poultices made of animal flesh and the like, should be used, with fomentations, followed by cold applications. An oily glyster is to be administered internally, and ghee prepared with medicines which correct or diminish the diseased wind. 5, When the injury has been produced by a heavy body falling on, and fracturing the bones, and injuring the soft parts, so that the wound is filled with marrow and blood; and the 6th variety of wounds is, when the injury is produced by a part of the body coming with violence against a hard body, by which blood is discharged, and the part becomes hot. Should little blood be lost at the time of these injuries, severe inflammation, and copious suppuration will be the consequence. In such cases, and indeed in the general treatment of wounds, cold applications are to be applied. This, how-

ever, will be varied with the part of the body injured.

When the wound is of the head, with a flap of skin, it is to be kept in its place by sutures and a bandage. If a portion of the ear is cut off, it is to be restored to its position, and, by means of sutures and bandages, it is to be kept there. When the windpipe is wounded, and the air passing through it, the wound is to be sewn up closely, smear it with some ghee of the goat, and put over it a circular bandage. The person must lie on his back for some time, and take only fluid food.

Should the extremities be severely wounded with fracture of bones, retain the parts in their natural position, apply oil, and a bandage over the part. For wounds of the back, the patient is to remain on his back; and if the wound be of the breast, the person must remain lying on his breast: in both cases, to prevent purulent secretions collecting within the wound.

When an operation is decided on, a fortunate moment is selected, and curdled milk, corn, &c., are to be offered up to the gods for the success of the operation, and Brahmins to be propitiated with gifts. A clean and well-lighted room is to be chosen in which the operation is to be performed; and bandages, the leaves of trees, thread, honey,

ghee, the juices of different kinds of trees, milk, oil, cold and hot water, are to be in readiness, and strong and steady assistants to hold the patient, while care is taken not to frighten him. Should the patient be very fearful of the knife, or very young, escharotics, the nail, or a sharp piece of the bark of the bamboo, may be substituted; and for the mouth or eyelids, a kind of grass, or other rough leaves, may be substituted, by rubbing them over the part. The patient is to be placed with his face to the east, and the surgeon before him with his face to the west.

The knife should be wet with water before being used. The season for operating is when the sky is clear in the rains, and during the evenings and mornings in the hot weather. If possible, operations should be performed near the new moon, as this is the most favourable time. If the person is weak, much diseased, or insensible, or if the disease has come on suddenly, the operation should be performed during the evening or morning, when the weather is steady and seasonable; a propitious day and hour is to be found out.

When a boil is to be opened, or the flesh divided, the part is first to have certain escharotics rubbed over it to diminish the pain. When a

vessel, joint, or sensible part is to be divided, oil is first to be rubbed over it.

The surgeon should hold the knife firm in the hand; if it has been thrust into a boil and no pus follows, it is to be quickly withdrawn. If there be much pus in the part, it may be opened several times if necessary; boils are not to be considered dangerous if elevated upon a flat surface. Should this not be the case, and the boil does not rise, but extends, the diagnosis is less favourable. The surgeon should be strong, and operate quickly; his knife should be good, and he should neither perspire, shake, nor make exclamations. In performing operations, the sensible parts of the body are to be avoided; as the palms of the hands and soles of the feet, vessels, tendons, joints and bones. When near vital organs the knife should be held so as to cut outwards; and should any such organ be wounded it produces severe pain, and is cured with difficulty. If the vital part in an extremity is wounded, it is to be amputated to save the individual's life. If the bone of the head or breast be broken, it is to be raised by the assistance of instruments. (Susruta.)

When the fœtus is dead in the uterus, in ascites, piles, or in certain excrescences and swellings near

the anus, which have existed upwards of a month; the patient is to take dinner before the operation, and it is to be completed while withdrawing the knife. Cold water is then to be applied to the part, the pus is to be squeezed out, and the part cleaned with tepid water. Lint, smeared with honey or ghee, is then to be put into the wound to prevent its closing. The wound is to be rubbed with honey or ghee, and a bandage is then to be placed round the part. The person's spirits must be kept up.

These operations are often very imperfectly described. They were bold and must have been hazardous, were performed by a select few, and were reduced in number and importance when the native states were broken up, and the Mahommedan rule established. This explains the detailed relation of operations and instrumental practice contained in the ancient writings of the Hindus, which are considered by the moderns as inspired, and consequently held in the highest respect.

Means of removing foreign substances from the body. There are two kinds of such extraneous substances, one of which is firmly fixed in the body, and the other is loose. The first is the only kind requiring remarks, and there are fifteen recognised ways of removing such bodies. This

is sometimes done by drawing out, or by thrusting through the part. If at the time of wounding the person faints, water is first to be thrown upon his face. After the blood has been discharged from the wound, heat, oil, and ghee, and the like, are to be applied to the part. Then put ghee and honey over the wound, bind it up, and order suitable diet, &c. If a vessel or tendon be wounded, the instrument is to be removed by pincers. If it has disappeared under the swelling it is to be pressed, so as to force out the weapon; or if there be barbs, enlarge the wound, and so remove it. A loadstone may be used when the iron is straight, and is not tightly embedded in the flesh. If it has penetrated the bone, it is to be removed with force, and if required, a string may be tied to the tooth of an elephant, to the neck of a horse, or to a bent branch of a tree, and thus forcibly removed. If in the throat, the extraneous matter may be removed, by thrusting down a hot iron through a metallic tube to detach it. For removing fish-bones in the throat, drink fluids, exhibit emetics, or a probang may be had recourse to; or blows upon the back.

Medicines to promote suppuration are used; that the foreign body may be discharged with the pus and blood. In other cases they are removed by the

natural discharges, as by the tears, or from the nose by errhines; or by blowing, when a substance has been introduced into the larynx, producing great irritation, and strong efforts of coughing, &c. If the extraneous substance have passed to the intestines, purgatives are to be given. If wind, urine, and dejections are not discharged, and are not removed by the efforts of the person, or if the fœtus is retained, they are to be removed by manual means. When wind, water, or poison deranges the blood, or when there is bad milk in the mammæ, it is to be removed by sucking or cupping, as the poison of serpents is extracted. When grief is the cause, joy will remove it. When the foreign substances are retained they produce fever, uneasiness, swelling, suppuration, and the person will die.

Amputations. The dread of hœmorrhage did not deter the Hindu surgeon from amputating the limb under desperate circumstance. In these cases, boiling oil was applied to the stump, with pressure, by means of a cup-formed bandage, to arrest the bleeding. Pitch appears to have been added, to assist in stopping the blood.

Various vegetable decoctions, &c., were us to advance the healing process in wounds. The unfavourable symptoms in these cases were: col-

lections of blood, high fever, and great heat of the body, with acute pain, shivering, coldness of the extremities, redness of the eyes, giddiness, delirium, convulsions, difficulty of breathing, dulness of the senses, stoppage of the secretions, or a thin serous discharge from the wound. Other bad symptoms are erysipelas, tetanus, madness, hectic fever, cough, vomiting, diarrhœa, hiccough, &c.

Lithotomy. Gravel and stone are very common in some parts of Hindostan. The calculi, from the more relaxed state and less nervous temperament of the person pass more easily with the urine than in more temperate climates; and are often found implanted near the extremity of the urethra, and require to be removed by enlarging the orifice; or, when at a distance from the extremity, by cutting down upon the calculus.

The Hindu writers suppose that a urinary calculus is produced by deranged humours, and the physician is recommended to restore these derangements, and so cure the disease. But when this is not accomplished, it is necessary to have recourse to the knife; and as the operation is difficult and dangerous, the surgeon should receive the sanction of the rajah for its performance.

When this is decided on, Susruta informs us, the patient must have aperients and ghee administered internally, for several days previous to the operation. When robust, the strength of the patient should be reduced in the usual way. Before the operation, the instruments should be arranged so as to be at hand when required, prayers should be offered up, and the patient encouraged to hope, by kind words. He is to be placed on a table, supported by a person behind, who separates his legs, which are to be bent and tied to the two wrists. The abdomen is then to be rubbed downwards, so as to make the stone descend; while the index and middle fingers of the left hand, well-oiled, are introduced into the rectum, and the stone felt and brought low in the perineum, so as to make a protuberance. Should the patient faint at this stage of the operation, it should not be proceeded with, else the patient will die. An incision is then to be made over the stone, on the left side of the perineum, a barley-corn in breadth from the raphe, and an inch from the anus, and carried down to the stone. The incision is then to be enlarged in proportion to the size of the stone, and it is removed by an iron scoop. If there be more than one stone they must all be removed, taking care not to break

the stone, nor to leave any fragments behind, as it will, in such a case, slowly form again. These small fragments may be removed by a scoop.

The incision may be made on the right side of the perineum, always taking care during the operation to avoid the raphe with the seminal canals, the vessels of the spermatic cord, and the rectum. If the seminal canals or the spermatic vessels are wounded, the person will become impotent. Wounds of the rectum and raphe will produce most distressing pain. This is the operation which was in Europe called "cutting on the gripe," or the "apparatus minor."

The high operation of lithotomy was sometimes performed, and was considered so dangerous, that in the female it was performed by the husband.

In the female the bladder being situated near the uterus, care must be taken not to thrust the knife directly forward, as it will wound the uterus. The urine passes through the vagina, forming a fistulous opening.

After the stone has been removed, place the patient in a hip-bath of warm water to promote perspiration, and to prevent the accumulation of blood in the bladder. Should this collection of blood take place, it is to be removed by injecting a decoction of the Ficus Indica by means of a

syringe. To heal the urinary passages, administer sherbets, and apply honey and ghee to the wound. Barley-water with warm ghee is to be administered twice or thrice a-day, for three days, to keep the urine pure; and then give sugar, rice, and milk in small quantities for ten days; and fruits, and broths made of the flesh of game animals for ten days; and for ten more days, promote perspiration by means of warm fomentations with oil and ghee. The wound is to be cleaned with the decoction of the Ficus Indica tree, and other astringent medicines are to be applied to the wound. Oil and turmerick is also used with much benefit. When the urine passes by the natural passages, sweet decoctions are to be administered by glysters; and should the wound not heal up, and the urine pass by the natural passage, the actual cautery must be applied to the fistulous opening.

When the calculus is small and produced by semen, and cannot be dislodged from the urethra by pressure, an incision is to be made over it, and the calculus removed, by means of a hook. The careless and dirty habits of the Asiatics render this of very frequent occurrence.

After the operation of lithotomy, riding on horseback, or elephants, or carriages, as well as venery, should be avoided for a year. The patient should

also avoid swimming in water so as to stretch the wound too much, and eating indigestible food to irritate it.

Besides this, the earliest description of lithotomy, Susruta gives a description of the means to be employed in performing *gastrotomia*, or cutting open the abdomen; *gastroraphy*, or sewing wounds of the belly; *gastro-hysterotomia*, or cutting into the womb, or the Cæsarian operation; *herniatomia*, to release strangulated hernia; the *rhinoplastic*, operation for forming a nose from the integuments of the forehead; for curing fistulo-in-ano, &c. All these operations are supposed to require a knowledge of anatomy, which they probably possessed.

Hernia is described in Susruta as the descent of a loop of intestine, produced by carrying heavy weights, jumping, fighting with a strong man, or such like violent exercise, which forces the bowel, by means of the wind, from the abdomen into the groin, and, if not arrested, into the scrotum. The tumour is of an oval form, and if properly pressed upon, ascends with a peculiar gurgling noise. If it cannot be returned, it is to be treated as a wind tumour, with fomentations and oleaginous purgatives.

For curing hernia the following plaster is recommended to be applied to the part to prevent

the descent of the bowel. Take a quarter of a tola of pinus longifolia, acquilaria agallocha; pulchut root, pinus devadaru, and dry ginger. These are mixed and made into a paste, with rice-water and cow's urine. The plaster is applied over the hernial canal twice or thrice a-day, as required. When a complete cure is required, apply a half-warm cautery over the neck of the canal, so as to produce adhesive inflammation and an obliteration of the canal.

Rhinoplastic operations, or means of improving and forming new ears and noses. A particular ceremony is performed for boring the ears of children, which it is not necessary to describe: as ornaments are hung from the ears, it is of consequence to remove defects from them. Susruta gives directions for performing fifteen different operations. However, the experienced surgeon will vary the operation according to the circumstances of the case, and according to the nature of the defect. Sometimes these are produced by accidents, or by internal causes. If the helix or antihelix is defective, the body of the external ear is to be half cut through, so as to bind it in its natural form. If there is a deficiency in these parts, a portion of the skin of the same size and figure is to be raised from the cheek, the blood

stopped, and a bandage applied, so as to keep the parts together of the natural figure and shape. The patient should not sleep during the day, nor eat much, but remain in a cool situation, and avoid fatigue. When the part is properly healed, apply an oleaginous ointment, prepared with wax, oil, and fat. When the parts are healed up the lobe may be pierced, according to custom.

If not properly performed, many bad consequences will follow these operations, as indurations, swellings, ulcers, &c.

The nose may be destroyed by disease; but a much more common cause is its excision, as a punishment, in the native courts of law, in many parts of Asia. When such a deformity is to be restored, a fresh leaf is cut of exactly the size of the nose, it is then to be placed upon the cheek, and the necessary quantity of skin and cellular membrane is to be traced. The remains of the nose are then scarified, and after dissecting up the flap, it is to be placed upon the raw part of the nose, to which it will adhere. Sutures and bandages are applied to keep the parts together. After the bandage has been applied, a couple of wooden canulæ are to be introduced into the nostril to allow breathing, and to support the new nose. A piece of linen cloth previously soaked in oil is to

be applied over the bandage. An aperient is then to be given to the patient, and his general health is to be attended to. Should any other deficiency of the nose be present it may be supplied in the same manner. If the nose should be deformed it may be reduced in size by the knife.

SECTION VI.

SURGICAL ACCIDENTS

Are fractures, dislocations, scalds, and burns; the effects of lightning and smoke.

Fractures and their treatment. Fractures are produced either by falls, pressure, blows, or sudden and violent contraction of muscles.

Twelve varieties of fractures are recorded:—as when a bone is fractured near the middle, with a swelling like the form of a crab; when the bone protrudes, like the ear of a horse; when the bone is crushed, and the fracture is accompanied with bruises; when the bone is depressed, without swelling; when a small part of the bone is raised from its place; when a large bone is fractured; when a broken part of a bone is thrust into the fractured bone; when it is separated; when partially fractured;

when only a small part of the bone remains unfractured; when comminuted, without pain; and when the bone is swelled, with small openings. These unnecessary divisions have each a particular name. This class of accidents are distinguished from a simple swelling, by a crepitating noise when moved; by a looseness and weakness, and by great uneasiness and pain in the part.

In treating such cases, the fracture is first to be reduced by bringing the broken parts together; and should the fractured parts ride over each other, they should be drawn out and pressed down, and kept in their proper place. Then apply a decoction made of the bark of the moduka urumbora, ossoka, polassa. In other cases the bark of modista, instamola, and rokto-sun donan mixed and rubbed to a pulp with water, to which a little glue and flour are added. The skin over the fracture is to be gently rubbed with this mixture. The bark of the bot-tree is then put over the member, which is then to be secured with a splint. This consists of small thin slips of bamboo, bound together with strings, of sufficient lengths to extend beyond the extremities of the broken bone; admitting the passage of air, and thus favouring the functions of the skin. They are sufficiently light and flexible to be moulded to the fractured member (see draw-

ing, page 354, No. 23.) I have frequently used this admirable splint, which requires little or no padding, and I consider it superior to those used in Europe; particularly for fractures of the thigh, humerus, and radius and ulna; care being always taken that they are only applied moderately tight.* They are, also, very useful in combination with triangular and other splints. If hanked, or too tightly applied, the splint will produce pain, swelling, and inflammation; and when too loose the bandage will not keep the broken bones in sufficient position, to ensure a proper bony union. When the fracture extends to a joint, with much inflammation, blood is first to be removed from the part, before having recourse to other remedies. In this case, a cloth, or the flexible bark of trees is to be applied round it, so as to allow a little movement, by which the joint will not be anchylosed.

The bandages should be removed every seventh day, in cold weather; in a temperate season every fifth day; and in hot weather, every third day; or according to the individual circumstances of the case.

* It is a gratifying fact, that since the first edition of this work, these splints have been introduced into this country, under the name of "Duncan's Patent Ratan Cane Splint," and adopted by the Director-General, Army Medical Department, for the use of the British Army, and by many surgeons in private practice. Kennan's Elastic Garden Seats, are, also, useful modifications of the same Eastern splints.

Cold astringent decoctions of the bark of different trees should be applied over the bandages, when the injury is accompanied with pain and inflammation; such as a decoction of the citrus aurantium (nagrodhor), ficus glomerata (udambar), wild fig, (religlosa aswatha), millingtonia pinnata, (batá) &c. At the same time the part should be kept perfectly at rest, and every care taken to keep down inflammation, and prevent suppuration. After a few days, warm oil should be applied over the part, prepared with different drugs, to be varied according as the wind, bile, and phlegm are affected.

Fractures are easily united in youth, and usually require one month for their cure; in middle age, two months; and in old age, three months. Fractures do not unite so quickly when the persons are old and eat little, are intemperate, or are affected by a severe disease. Such persons should avoid salt, astringent, hot, and acid food, also connection with women, exposure to the sun, and to fatigue. They should also avoid dry food, and live on soft boiled rice, animal broths, milk, ghee, and such like nourishing food. When the fracture is compound, the same plan of treatment is to be followed, as recommended for simple fractures; the wound being dressed with ghee, honey, and astringent decoctions.

Fractures are dangerous when comminuted, or when involving one or more bones of the head, or the thigh bone or pelvis; when they extend to joints, or are produced from falling from a great height. They are also dangerous when the person is very weak, very old, or affected with ulcers, or leprosy, and when bad symptoms of wind are present.

2. *Dislocations and their treatment.* This accident is known by the limb being either lengthened or shortened, and the bone being either turned inward or outward, accompanied with pain, particularly on moving the joint. There are six varieties of this accident: when the dislocated joint is crushed and swollen, both above and below, with much pain, which is increased at night; 2nd, when the swelling and pain are continual, and without any movement in the joint; 3rd, when the joint is twisted; 4th, when one part of the joint is turned outward with severe pain; 5th, when one of the bones of the joint is displaced; and 6th, when one of the bones is forced downwards with much pain.

The treatment of dislocations is to be commenced by applying fomentations, and warm oleaginous applications, with frictions, so as to soften and relax the parts. The surgeon will then reduce the bone by forcing it out of its new position, and

pressing it in the opposite direction from that in which it had been displaced, so as to allow it to slip into its natural position.

When the hip or knee-joint is dislocated, the extension must be made with a kind of a pully called *chakra*. When reduced, the patient should be placed in bed, and the part at rest. When of long standing, fomentations and oleaginous frictions are to be diligently applied before the bone is reduced.

A dislocated rib is to be reduced by pressing with the thumb and second finger, after the soft parts have been well relaxed by being rubbed with ghee. A proper splint and bandage is to be applied to keep the bone in its position.

The dislocated humerus is to be reduced by pulling the bone strongly downwards, or along the side, after a pillow or ball had been put in the axilla, when the bone will slip into its place. The joint is then to be surrounded with a bandage which passes round the axilla and the neck in the form of 8. This bandage is called swastika.

The dislocated elbow-joint is to be reduced by the extension and flection of the fore-arm, while pressure is made by the thumb and fingers upon the displaced head of the bone.

The same means are to be employed in order to

reduce the dislocation of the wrist and ankle-joint.

When the bones of the neck are dislocated, it is to be reduced by a person placing his thumbs under the angles of the jaw-bone, and fingers upon the side of the neck, and pressing the head slowly upwards, while another person retains the body at rest. When the dislocation is reduced, the person is to be kept in an erect position for a week.

The dislocation of the lower jaw is to be reduced by drawing it downwards, when the bone will slip into its place; the part is then to be rubbed with warm ghee, and a four tailed bandage is to be applied over the chin, so that two of the bands are tied behind, and two on the top of the head.

When the bones of the nose are depressed, they are to be raised into their natural position by means of an instrument called sháláká; and a hollow wooden tube is kept in the nostrils, so as to retain the bones in their natural position. Ghee is then rubbed externally over the part.

After a dislocated bone has been reduced, a plaster is to be applied to the part, consisting of munjista, liquorice, red sandalwood, and rice, which are to be pounded separately, and mixed together. The plaster is then to be formed by

mixing the powder with ghee, which has been washed a hundred times in water. This plaster is to be continually applied over the dislocated joint for a considerable time after it had been reduced. Should there be much pain in the part, a cold infusion of maghadha panchamuli in milk, and chakra oil are to be applied.

Every morning during the treatment, some prepared ghee, mixed with such medicines as will improve the health, and keep the bowels relaxed, is to be taken.

In sprains and bruises nothing is to be done, except the application of cold lotions and plasters. In some cases circular bandages covered with ghee by itself, or mixed with a decoction of casha (a kind of grass), are to be applied over the part.

The treatment is said to have been proper when no deformity is left in the part, and it has its natural actions.

3. *Scalds and burns.* There are four degrees of burns:—Scalds, in which there is severe pain, with a change of colour in the part; hot remedies are to be applied.

When the burn is accompanied with blisters and much pain, then sometimes cold, and at other times hot applications should be used, with ghee and fomentations.

When the burnt part is of a black colour, with little pain, and does not blister, in such cases a paste of sandalwood, yellow earth, and the bark of the wild banyan tree, are to be mixed with ghee, and applied to the part. The flesh of domestic animals is also recommended to be chopped fine, and applied to the part.

When the burn has been still more severe, so as to destroy the part, it will be accompanied with fever, thirst, faintness, and will heal slowly. The dead parts are to be removed, and cold applied; a decoction of the bark of the *tinduka* tree is to be mixed with ghee, and applied cold to the part. In other cases, an ointment made of wax, liquorice root, ghee and resin may be applied.

4. *Lightning.* When a person is struck with lightning and is not killed, anoint the body with oil, and use frictions assiduously.

5. When a person choked with *smoke,* and suffers from difficult and sonorous breathing, with cough, and red and burning eyes, followed by difficulty in breathing and smelling, fever, and thirst; the juice of sweet and acid fruits should be used as an emetic to clear the stomach; and the juice of the sugar-cane and grapes should be given, mixed with water and sugar for drink.

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